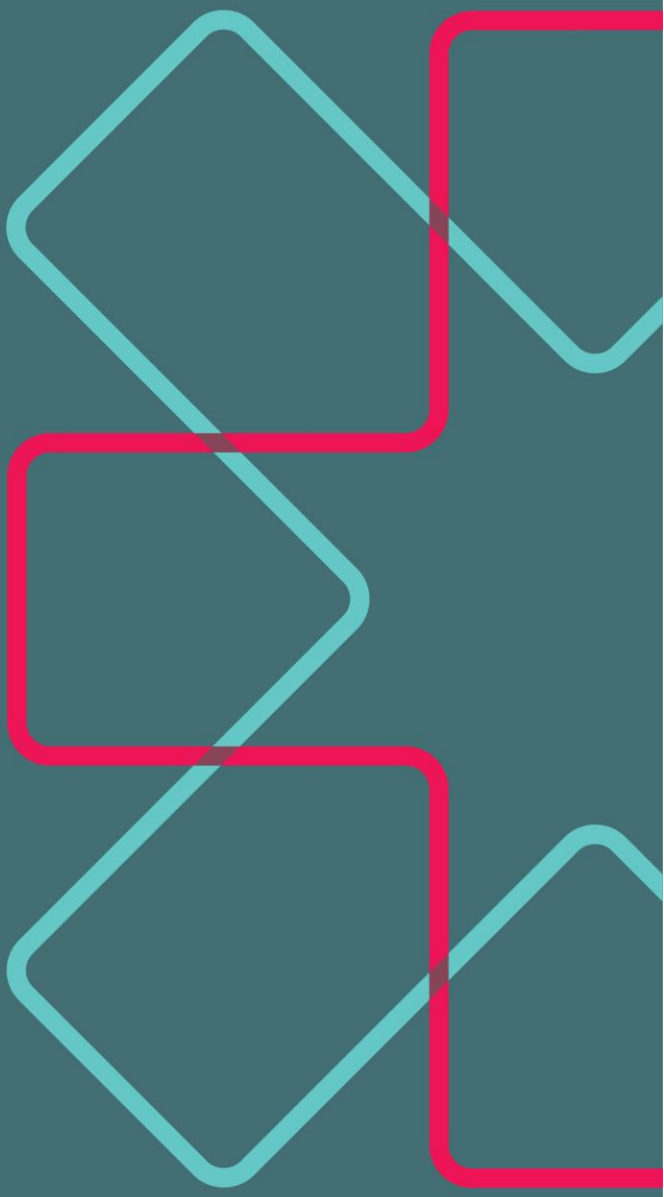
Economic Benefits of Effective Resource Management

Final Report



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Preface

This report has been prepared for the Ministry for the Environment by Joey Shannon and Anamaria Rodriguez from MartinJenkins (Martin, Jenkins & Associates Ltd).

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Introduction

Background to the work

The resource management system is among the regulatory systems with the greatest impact on the functioning of the New Zealand economy. Resource management is understood as a system of laws that governs how people interact with natural resources. In addition to managing air, soil, freshwater, and the coastal marine area, laws such as the Resource Management Act (RMA) and its intended successors regulate land use and the provision of infrastructure[1]. Resource management for the purpose of this report does not generally extend to issues of other regulatory systems that may include the use of resources or investment in public works or public service. The resource management (RM) system directly or indirectly influences virtually all aspects of market economic activity though its enablement and restriction of use of natural resources, including land. Critique and intended reform of the resource management system has frequently focused substantially on how a more effective system might better enable productive activity.

Nevertheless, understanding is mixed on the extent to which resource management influences economic outcomes, and the features of a system associated with improved outcomes.

The discussion here often, and understandably, takes a 'cost perspective' focusing on:

- Financial administrative costs of the system
- Financial compliance costs to system users
- Opportunity costs in terms of foregone economic activity.

In this framing, the avoidance of such costs is how a resource management system can contribute to economic outcomes. It is also the case that this cost framing is where much of the evidence base lies, and provides a sound way to inform, for example, CBA of a system change.

In general, there is more readily available evidence on costs and cost reduction, than positive benefits. This gap reduces the ability for advisors to consider the full scope of how an effective resource management system can support positive economic outcomes.

Our scope and approach

The Ministry for the Environment commissioned MartinJenkins to produce a report examining how an effective resource management system can contribute to producing benefits in the market economy. This research seeks to answer three related questions:

[1] Resource management system | Ministry for the Environment

- What is the nature and scale of benefits that might be achieved through effective resource management?
- What are the features of resource management systems that are associated with realising those benefits?
- What are the gaps in the evidence base that reduce our ability to understand the relationship between resource management and economic outcomes?

There is no single definition of what constitutes effectiveness in a resource management system, as this is related in part to overall priorities. As part of the current reform process Cabinet has agreed the following objectives for the reformed system:

- Unlocking development capacity for housing and business growth
- Enabling delivery of high-quality infrastructure for the future, including doubling renewable energy
- Enabling primary sector growth and development (including aquaculture, forestry, pastoral, and horticultural activities, and mining)
- Safeguarding the environment and human health
- Adapting to the effects of climate change and reducing risks from natural hazards
- Improving regulatory quality in the resource management system
- Upholding Treaty of Waitangi settlements and other related arrangements.

There will be, in some cases, trade-offs between these objectives. This report does not cover all aspects of potential benefits from resource management and we therefore apply a somewhat narrower focus on effectiveness than would be required by a more comprehensive assessment. For the purpose of this report, we consider effectiveness in terms of the ability of the system to efficiently achieve market economic benefits, while managing externalities and avoiding non-market costs including in terms of negative impacts on the environment and human health.

The approach used to explore these questions was a desktop literature review. Domestic and international literature was reviewed, with a preference for domestic sources, or those from jurisdictions with broadly comparable governance and economic systems. Sources with monetised or quantified benefits were also preferred. Sources included academic studies, historical cost-benefit-analysis of systems or parts of systems, and government and industry reports. A full list of sources reviewed can be found at the end of this report.

Sources were classified according to a benefits typology (see below). The report is structured primarily around these benefit areas. Conclusions and findings associated with each benefit area are presented, and well as cross cutting findings in the conclusion.

This report includes studies that consider previous, current, and proposed resource management settings in New Zealand. In some cases, it includes sources that studied proposed changes or reforms

that were not ultimately advanced but can still inform the overall questions of the report. It is not however, an assessment of the existing resource management system, or benefits of a shift in line with the Government's reform proposals currently under development.

Framework and structure of this report

'Economic benefits' can potentially be interpreted very broadly to incorporate essentially any benefit associated with resource management that can potentially be measured and monetised. *Economic benefits* for the purpose of this report includes benefits that contribute to the following *economic outcomes*:

- Economic growth through improved productivity[2]
- Economic growth through increased productive activity
- Increased social surplus (consumer, producer surpluses, and tax revenue) in existing activities in the market economy
- The maintenance and growth of financial, physical, natural, and human capital.[3]

Our review of the literature points to a wide range of economic benefits that effective resource management can contribute to. Example of identified benefits include:

- improved competition
- innovation
- residential and commercial development
- well-functioning urban form including transport efficiency
- efficient and affordable provision of infrastructure
- natural resources utilisation and productivity
- creation or maintenance of natural capital and ecosystem benefits
- built environment and natural resource resilience to natural hazards
- quality and accessible information
- tourism destination attractiveness
- enhanced population health
- lower costs through efficient administration.

[2] Whether through increased within-sector productivity or shifts towards more productive sectors.

[3] This includes three of the 'four capitals' included in the Treasury's Living Standards framework. Social cohesion of 'social capital' is not included due to the absence of identified evidence linking resource management systems to social capital.

Where possible, a long-term view of economic benefits and outcomes is taken, particularly in light of the role of natural capital in providing long-term economic benefits. A short-term view could see market economic benefits at the cost of reduction of long-term natural capital appear unduly attractive.

For the purpose of this report, we have focused primarily on benefits in the observable market economy.[4] This generally excludes areas such as:

- non-market consumption
- existence benefits
- non-market ecosystem benefits
- cultural benefits.[5]

However, this is not a firm line. For example, non-market ecosystem benefits can in some cases indirectly provide for market benefits, such as in the case of 'green infrastructure' that may reduce the level of expenditure required on traditional infrastructure to achieve a particular outcome. The rule of thumb applied is whether there is a sufficient clear connection back to one of the four economic outcomes described above.

Providing a view on the optimal balance between these market-economic and non-market outcomes, or the design of a system to provide that balance, is outside the scope of this report. Nevertheless, in exploring these outcomes, consideration is also given to the appropriate mitigation or internalisation of negative externalities, such as such as air and water pollution, impacts on biodiversity and landscapes, and urban externalities, such as glare and noise, where the evidence informs these issues. In general where the potential for such externalities are unconsidered, the genuine achievability and value of identified economic benefits is given less regard.

Report structure

The report is structured around seven economic benefit areas that contribute to the high-level economic outcomes identified. Three of these economic benefit areas are 'domain areas' that contain their own relatively distinct set of issues, and associated literature (although there remain an inevitable degree of cross over). Between them, they cover the primary vectors by which a resource management system influences the market economy.

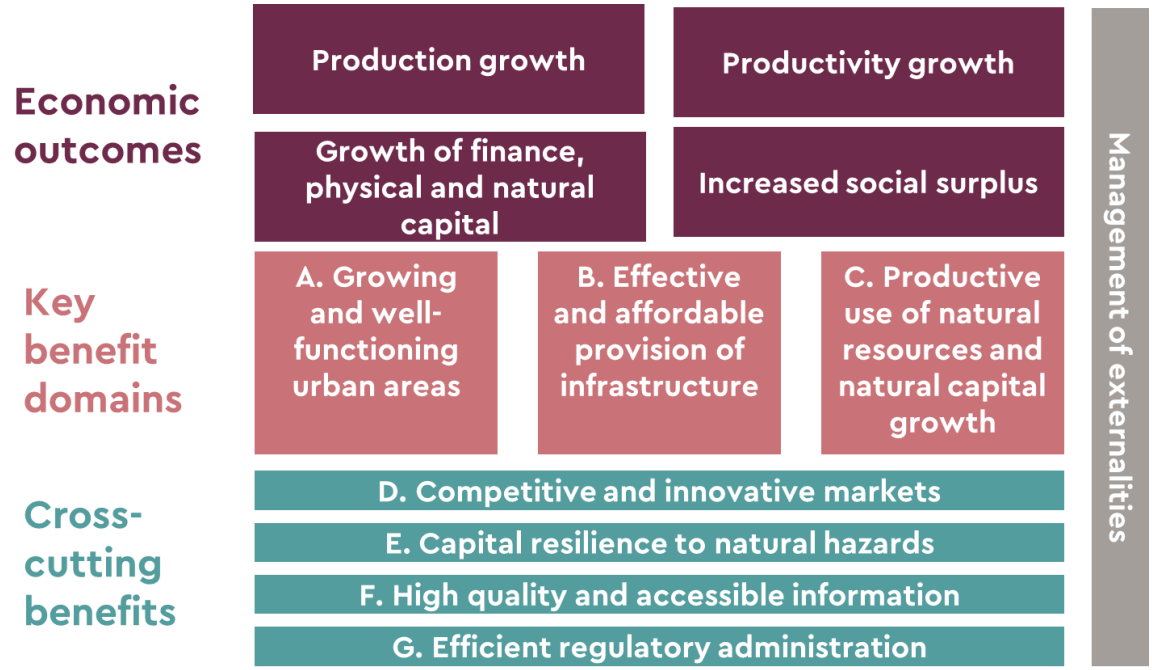
Four are cross-cutting benefit areas that are relevant to all three domains. Management of externalities is an area of interest across all benefit areas, so is discussed throughout rather than separated.

[4] In practice, not all evidence is structured in a way that fully separates market economic benefits from other benefits.

[5] This is not to suggest that these benefits do not exist, are not relevant to effective resource management or are neccessarily less important than market economic benefits.

The diagram below presents the structure of these benefit areas:

Figure 1: Report structure



Each benefits section includes a brief introduction describing the relationship of that benefit area to the economic outcomes, and how, at a high-level, a resource management system might influence it. This is followed by a structured summary of relevant literature focused on the two key questions discussed above (scale and nature of benefits and features of a system associated with enabling those benefits) as well as commentary on externality management if relevant. This is followed by a findings section drawing out insights from across the evidence base.

In many cases, the sources presented in one of three benefit domain areas also have relevance to one of the cross-cutting benefits. These are not repeated but are drawn on when considering the findings for that section.[6] Where this is the case, footnotes are provided to identify the other relevant sections.

The report concludes with a brief identification of common findings across the benefit areas, as well as commentary on notable gaps in the evidence base.

Limitations and clarifications

This work is based on a desktop review and covers a relatively expansive topic. It is reliant on the published evidence base that was identified by MfE officials, that we identified, and through a

[6] For example, one of the clearest ways in which resource management systems influence competition is through their influence on the competitiveness of supply of residential property. Relevant sources are primarily presented in Section A. Growing and Well-Functioning Urban Areas but inform the findings in the Section D. Competitive and Innovation Markets.

response to a request for sources from officials at Te Waihanga – Infrastructure Commission, the Ministry for Primary Industries, the Ministry of Business Innovation and Employment, the Department of Internal Affairs, the Ministry of Housing and Urban Development, and the Treasury.

It has not been possible to identify all potentially relevant sources, and this may mean that some commentary on gaps in the evidence base reflects areas of evidence that neither we, nor the officials we request source from, were successful at identifying.

The report seeks to identify features of resource management systems associated with economic benefits. This is reliant on sources that both identify economic benefits (or potentially avoidable costs) and relate these to features of a system. These connections are largely taken at face value for the purpose of this report as it has not been possible to subject each of these associations to deep scrutiny. Instead, we have relied on commonality of findings across multiple sources to develop observations.

We have prioritised sources with quantitative estimates of potential benefits as being the most reliable means of assessing the substance of claims around economic benefits. However, this may be to the partial exclusion of some areas of research less oriented towards quantification, such as comparative institutional analysis.

Although this report is oriented around benefits, a majority of the relevant research base has a 'cost' framing. We generally interpret avoided costs as benefits, where it is reasonable to believe this can be achieved through more effective resource management without disproportionate increases in negative environmental impacts or other negative externalities.

Generally the report takes the perspective of identifying potential benefits with respect to more effective approach to resource management than the current system. However, only a subset of the evidence reviewed is specifically focused on the current New Zealand approach to resource management.

Benefit Areas

A. Growing and well-functioning urban environments

Introduction

Urban development, including residential and commercial development, has a multifaceted impact on economic outcomes. In part due to well-studied agglomeration effects, cities are typically more productive than other areas, and larger cities tend to be more productive than smaller ones. The ability of individuals to move to areas where they can be more productive and earn more is in no small part influenced by the availability of housing and commercial premises. At a national level, housing supply influences the attractiveness of New Zealand as location for overseas talent and the capacity of the economy to grow the labour force and economy as a whole.

Well-functioning cities that enable individuals to reduce transport time and financial cost increases access to the jobs and consumer experiences that best support productivity, consumer surplus, and overall levels of commerce. More directly, residential and commercial construction and related activities are a large contributor to employment and overall production.

At the same time, the fundamental feature of urban areas – large numbers of people living and working in proximity – creates potential for a wide range of externalities (positive and negative) affecting other residents and businesses associated with development.

Few areas of economic activity are more directly influenced by resource management systems than residential and commercial development, and more broadly urban development and form. This is likely to manifest in relation to[7]:

- restrictions on development that affect urban land being applied to its highest and best use
- the extent to and means by which both positive and negative externalities of development are accounted
- enablement of competition in residential and commercial property and services
- influence on patterns of development that have flow-on effects to infrastructure requirements.

[7] Protection of capital stock from natural hazards is also relevant here, but discussed separately below.

Evidence review

The welfare effects of character protections on neighbourhoods (Greenaway-McGrevy & Jones, 2025)

This research examines the effects of character and heritage protections, and particularly floor-to-area (FAR) restrictions, on Auckland's household welfare.

- **Scale and nature of benefits:** Character protections enhance the appeal of neighbourhoods by increasing their desirability. However, the welfare benefits from these amenities turn negative when strict FAR restrictions severely limit redevelopment. In Auckland, character protections are associated with negative welfare effects equivalent to a reduction in representative household income of between $330 and $1,368 per year. These adverse effects are particularly pronounced in high-demand areas, especially those close to employment centres or other valuable non-character amenities.
- **Features of a system associated with these benefits:** The evidence suggests that an RM-system less enabling of character or similar protection, particular in high-demand urban areas, would provide a net benefit to society.
- **Managing externalities:** Character controls are justified because housing owners aren't compensated for the public benefits of preservation. These restrictions preserve the positive externalities of neighbourhood character, but at the consequence of limiting housing supply.

Empty homes, longer commutes: the unintended consequences of more restrictive local planning (Cheshire et al., 2018)

This research investigates how England's tight land-use regulations can generate unwanted outcomes for households.

- **Scale and nature of benefits:** Strict land-use regulations have led to several inefficiencies in the housing market, including a 0.9% increase in the local vacancy rate and a 6.1% rise in commuting distances.
- **Features of a system associated with these benefits:** Although this article doesn't propose changes to the English planning system, it suggests that more flexible planning approaches could more efficiently allocate urban development.
- **Managing Externalities:** Restrictive policies create inefficiencies in the housing market by impeding the matching process between available homes and potential occupants.

Evaluating the long-run effects of zoning reform on urban development (Greenaway-McGrevy, 2023)

Using a monocentric city model, the study highlights how the upzoning policy (implemented in 2016) in Auckland influences land prices and development patterns.

- **Scale and nature of benefits**: Upzoning policy in Auckland has led to an estimated 18% increase in aggregate floorspace in upzoned areas compared to non-upzoned areas. This increase in supply is associated with a reduction in dwelling prices ranging from 23% to 39%, relative to a scenario without upzoning.
- **Features of a system associated with these benefits:** The study highlights how upzoning reforms can effectively address housing shortages and affordability issues by allowing for higher-density developments.

Restrictive land use regulations and economic performance (Osman, 2020)

This paper provides an assessment of the welfare costs associated with restrictive land use practices[8] in the US.

- **Scale and nature of benefits:** Land use regulations can affect housing affordability and accessibility in some regions, discouraging people from moving to areas with better job opportunities. Restricting migration to highly productive regions can lead to substantial economic losses, estimated at up to $1.95 trillion annually in the United States, or 13.6% of GDP.
- **Features of a system associated with these benefits:** The study indicates that land use restrictions can lead to improper allocation of businesses and industries, decreasing economic efficiency. Adopting a more balanced approach to land use policies could drive economic growth by facilitating greater mobility, optimising land allocation, and enhancing productivity. According to the author, this requires reviewing regulations that control migration patterns and impose urban growth boundaries, and limiting other restrictive land use practices, such as density limits and height restrictions.
- **Managing Externalities:** The research suggests that land use regulations are justified because they can reduce the negative externalities associated with certain types of development. However, while individual communities may perceive benefits from restricting land use, these limitations can incur significant costs to the larger regions and nations in which these communities exist.

Impacts of planning rules, regulations, uncertainty and delay on residential property development (Grimes & Mitchell, 2015)

This study presents the costs of the rules and regulations in New Zealand. It highlights that regulatory factors influence housing development costs and decisions in different ways. **Scale and nature of benefits:** Planning rules, such as building height limits and infrastructure contributions, significantly increase development costs. They can add $32,500–$60,000 per dwelling in subdivisions and

[8] Locally administered land use regulations that aim to maximise the welfare of individual communities.

$65,000–$110,000 per apartment. This creates delays and uncertainty for developers,[9] which discourages investment and slows housing supply.

- **Features of a system associated with these benefits:** New streamlined regulatory processes.
- **Managing Externalities:** The report points out that land use regulations are imposed because of the existence of externalities. However, this study focused on the cost and didn't assess whether the benefits of regulation outweigh the estimated costs.

Links between planning and economic performance: Evidence note for LSE Growth Commission (Cheshire et al., 2012)

English planning systems set rules and guidelines that control the supply and location of land usable for development. This research points out that some of the economic outcomes of this system include higher housing prices, lower quality, and more volatility, and higher office rents.

- **Scale and nature of benefits:** The research argues that planning policies that constrain the size of cities increase costs of developments and also negatively affect productivity in parts of the retail sector, such as supermarkets.[10] In this regard, it implies that reforms to the planning system should target the reduction of those costs.
- **Features of system (regulations or initiatives that drove these benefits):** A planning system that does not use strict land regulations, such as zoning or green belts.
- **Managing Externalities**: It argues that the restrictiveness of the system also results in some clearly unsustainable development. For example, some development has leap-frogged green belts into the countryside proper, resulting in more commuting, congestion, and pollution.

The planning premium: the value of well-made places (Savours, 2024)

This study assesses the value of town planning in England by estimating the 'planning premium' associated with quality urban design characteristics.

- **Scale and nature of benefits**: Effective town planning could unlock a 'planning premium' of over £70–90 billion in value and boost productivity by £23 billion through denser, well-designed urban housing over the next decade.[11]
- **Features of a system associated with these benefits:** Aligning planners, developers, and authorities, especially through Development Corporations.[12]

[9] Also relevant to the cross-cutting benefits associated with efficient regulatory administration.

[10] Also relevant to the cross-cutting benefits associated with competitive markets.

[11] Also relevant to the cross-cutting benefits associated with efficient regulatory administration.

[12] Organisations in which planners, developers and local political representatives work side by side to deliver on a strong regional economic remit.

- **Managing externalities:** The report highlights that the role of town planning is to mitigate against natural market failures, which include negative externalities, such as pollution or congestion.

The economic implications of housing supply (Glaeser & Gyourko, 2018)

This study reviews the economics of housing supply of US housing markets to understand the distribution of home prices, household wealth, and the spatial distribution of people across markets.

- **Scale and nature of benefits:** Land-use regulations impose a substantial "regulatory tax" on housing development. In highly regulated markets such as San Francisco, housing prices significantly exceed the cost of construction, with the implicit cost of regulation estimated at approximately $400,000 per unit. These constraints on supply drive up prices and restrict population growth by limiting new housing. The primary beneficiaries of these policies are existing homeowners, who gain from rising property values and often oppose new development that could lead to more affordable housing or increased density.
- **Features of a system associated with these benefits:** From an economic point of view, the authors argue that it makes sense for the government to offer fiscal incentives (for example, infrastructure funding, tax breaks, etc) to encourage local homeowners to support new housing development. This is justified by the broad national benefits of reducing supply constraints. However, from a political standpoint, it is difficult to justify asking average taxpayers to subsidise wealthier homeowners.
- **Managing externalities:** The authors acknowledge that development can lead to negative externalities and therefore, the optimal tax on new buildings is positive, not zero. However, they note a lack of consensus on whether current land-use regulations improve or reduce overall welfare, given the trade-offs between managing local impacts and enabling broader economic growth.

Cities with forking paths? Agglomeration economies in New Zealand 1976–2018 (Donovan et al, 2022)

This study examines the economic advantages of urban concentration in 134 locations across New Zealand over four decades.

- **Scale and nature of benefits:** The study found that agglomeration economies in both production and consumption peaked in 1991. Between 1991 and 2006, these economies declined by approximately 0.7 percentage points for production and 1.4 percentage points for consumption, remaining relatively stable since then. Notable spatial differences emerged from the findings. Large cities provide net benefits in production but not in consumption, whereas smaller towns near larger cities experience agglomeration economies that are above average.
- **Features of a system associated with these benefits:** The authors underscore the need for nuanced urban policies that consider the temporal and spatial dimensions of places. For example, while small towns near cities currently enjoy agglomeration benefits, such as low congestion, it can change as places evolve over time.

Cost-Benefit Analysis of proposed medium density residential standards (PWC & Sense Partners, 2021)

This report estimates the costs and benefits of the MDRS implementation.

- **Scale and nature of benefits:** The report estimated that the primary economic benefit of the MDRS was the decline in house prices that generated a transfer between existing homeowners and would-be homebuyers. In the medium term, the benefit-cost ratio was calculated to range between 1.27 and 2.47.
- **Features of a system associated with these benefits:** The report recommended implementing the bill, which represented a significant increase in housing enablement through greater 'by-right' development for intensification across major urban areas.

Can zoning reform change urban development patterns? Evidence from Auckland (Greenaway-McGrevy & Jones, 2025)

This paper quantifies the changes in land use across the Auckland metropolitan area after the 2016 upzoning reform.

- **Scale and nature of benefits:** Six years on from the reform, housing starts in upzoned areas increased substantially relative to non-upzoned areas. Each upzoned parcel had 0.045 more consents issued (on average) than non-upzoned parcels in 2021. They are also located closer to the CBD, employment locations, and transportation network access points, and are predominantly infill and attached housing.
- **Features of a system associated with these benefits:** Upzoning reforms can boost housing supply without contributing to urban sprawl.

Land-use, transport and population health: estimating the health benefits of compact cities (Stevenson et.al., 2016)

This study estimated the population health effects arising from alternative land-use and transport policy initiatives in six cities- Melbourne, London, Copenhagen, Denmark, São Paulo and Delhi.

- **Scale and Nature of Benefits:** The study estimated that transitioning to compact city urban environments could lead to health improvements, with gains ranging from 420 to 826 disability-adjusted life years (DALYs) per 100,000 people. This could result in reduced healthcare costs, improved productivity, and enhanced quality of life.
- **Features of a system associated with these benefits:** The shift towards cities with higher land-use density, shorter distances to public transport, and a reduction in private car use in favour of walking, cycling, and public transportation is key to these health benefits.

Impact of urban form on transport and economic outcomes (Donovan & Munro, 2013)

This research assessed the impacts of urban form on transport and economic outcomes and presented policies that could contribute to a more efficient urban form.

- **Scale and nature of benefits**: The study concluded that a compact urban form provides significant economic advantages. Their model estimated that a centralised employment pattern in Auckland could generate approximately $30,000 more output per employee compared to a more dispersed employment scenario, assuming other factors remain constant. A compact and centralised urban environment can enhance economic growth in Auckland by improving productivity.
- **Features of a system associated with these benefits:** NZ can enhance urban environments by making changes to policies regarding street networks, public transport, and land use. However, the report highlights the need for improved data, including more comprehensive transport demand datasets, better spatial GIS data, and micro-data sets.[13] Additionally, more research is needed on the impact of urban form on transportation and economic outcomes, specifically targeting particular areas.
- **Management of externalities:** The report explains how the presence of fiscal externalities[14] in the provision of public goods and infrastructure drive regional and local policies on urban growth. Councils should reduce land use distortions to prevent unintended consequences by properly evaluating the effectiveness of policies.

The value of urban design: the economic, environmental and social benefits of urban design (MfE, 2005)

The report explores whether there is value gained through good urban design.[15]

- **Scale of benefits:** Efficient urban layouts can reduce infrastructure and transportation costs, delivering long-term savings. Well-designed urban environments can also boost property values, attract businesses, and stimulate local economies. Additionally, integrating green spaces and sustainable design promotes environmental quality and resilience,[16] contributing to economic stability.
- **Features of a system associated with these benefits:** The report highlights that good urban design needs to operate at a range of scales simultaneously, from the site to the wider city or region. This is particularly so in respect of transport arrangements. Additionally, the delivery of

[13] Also relevant to the cross-cutting benefits associated with high-quality and accessible information.

[14] The unintended side effects that government fiscal policies exert on the economy, affecting markets and agents beyond the intended targets (Lee, 2025).

[15] The design of the buildings, places, spaces, and networks that make up our towns and cities, and the ways people use them.

[16] Also relevant to the cross-cutting benefits associated with capital resilience to natural hazards.

those benefits requires s a combination of several physical attributes (physical connectivity, a mix of land uses, and good street design, etc) as well as non-physical attributes.

- **Management of externalities:** The report points out that good urban design can help address adverse environmental and social effects, such as the "external costs" generated by low-density developments.

Urban land prices, a progress report (Infrastructure Commission, 2023)

The report explores patterns in urban land prices over the previous decade, with a particular focus on rural/urban differentials.

- **Scale of benefits:** The report shows that urban land prices are on average between 2.4 (Christchurch) and 4.4 (Auckland) times higher than rural land prices in major urban areas in 2021. This is up from averages of 1.3 (Hamilton) to 2.5 (Christchurch) in 2011.
- **Features of a system associated with these benefits:** While not stated explicitly, the report is suggestive of a more enabling approach to greenfield development from a planning perspective, while noting that the primary constraint is often infrastructure. The report points to regional spatial planning to identify the infrastructure that might be needed to support future growth and protect and acquire corridors of land and sites for future infrastructure, as well as a focus on non-build options where possible.

Land use planning: the damaging impact on retail productivity (Cheshire et al., 2011)

- **Scale and nature of benefits**: The research argues that restrictive planning policies in the UK, such as Town Centre First (TCF) policies, have reduced supermarket productivity by at least 20% by 'micro-managing' the location and size of stores. Furthermore, supermarkets are smaller and less productive in local authorities with tighter planning restrictions.[17]
- **Features of a system associated with these benefits:** Removing or making use planning restrictions – such as zoning – more flexible.
- **Managing externalities**: The research demonstrates that restrictive planning leads to inefficiencies, imposing costs on businesses. These inefficiencies represent negative externalities, as they ultimately burden households. The report suggest that relaxing planning restrictions could alleviate these externalities by addressing the inefficiencies at their source.

[17] Also relevant to the cross-cutting benefits associated with competitive markets.

Costs and benefits of alternative growth scenarios for Sydney (Rajaratnam & Manners, 2012)

This project considers the benefits and costs of alternative ways of accommodating part of Sydney's rapid growth across infill areas and through different dwelling types. The following scenarios for accommodating growth in population, dwellings and employment were assessed:

1. baseline: growth based on projections
2. balanced: growth in local and strategic centres
3. strategic: growth in major hubs (for example, the CBD and Parramatta)
4. dispersed: growth outside main centres
5. inner middle: growth near the CBD.

- **Scale and nature of benefits**: The benefit-cost analysis revealed that while differences in net public benefits between growth scenarios are relatively small, the balanced centres scenario stands out with the highest net benefit—$1,830 per new dwelling or $193 million in total compared to the baseline. In contrast, scenarios with highly concentrated development in specific areas (strategic) showed the lowest overall benefits.
- **Features of a system associated with these benefits:** The analysis found that no single approach is ideal for all areas. Efficient development requires balancing different benefits and costs. Allowing more varied growth across different areas tends to provide greater public advantages. The study highlights the need for adaptable planning policies that respond to market changes and ensure effective land use. It also stresses the importance of preparing ahead to align services with demand and the government's role in reducing policy and market barriers to enable new development in various locations and forms.
- **Managing externalities:** The research suggests that land use values are influenced more by demand than by externalities (supply factors). This suggests that policies should prioritise supporting demand-driven development rather than just managing external costs or benefits.

The value of land, floorspace and amenities: hedonic analysis and cost benefit analysis of planning regulations (Nunns & Balderston, 2015)

The paper examines the factors that contribute to a city's appeal and explores how policymakers can enhance its attractiveness.

- **Scale and nature of benefits:** The hedonic pricing model for Auckland showed that additional living space and increased proximity to the city centre have a strongly positive impact on house price. This suggests that people value private living space, especially in areas that have good access to employment opportunities and amenities.
- **Feature of system:** The study highlights that planning regulations that enable an increase in urban density on sites may improve welfare. However, given the trade-off between building floorspace

and public amenities, economic analysis can be used to understand and quantify planning trade-offs.[18]

- **Managing externalities:** Planning regulations can impose costs on individual property owners or households in order to provide or preserve public amenities or manage negative externalities associated with development patterns. A robust intervention logic for planning regulations should identify, and if possible, quantify these trade-offs. In doing so, it is necessary to distinguish between cases where most costs and benefits are purely private and cases where there are externalities that may require regulation to manage.

Understanding the costs and benefits of planning regulations: a guide for the perplexed (Nunns & Rohani, 2016)

The aim of this report is to assist in understanding and evaluating the costs and benefits of urban planning policies in Auckland.

- **Scale and nature of benefits:**
  - Regulations may manage negative externalities (harms imposed on other people who do not voluntarily choose to bear them) associated with new development, such as environmental, health and safety and land use externalities.
  - Regulations may facilitate positive externalities such as:
    - agglomeration economies in production (which arise when firms have good access to labour supply, customers, and suppliers)
    - agglomeration economies in consumption (which arise when increased urban scale and/or density enables a greater range of consumer amenities)
    - public goods and positive aesthetic externalities.
  - Regulations may enable efficiencies in infrastructure and public service provision.

Findings on developers' engagement (Ministry of Housing and Urban Development, 2025, unpublished)

This document provides a summary of the results obtained from engagement surveys and interviews conducted in May 2025 with 14 developers from 11 different organisations. The purpose of the engagement was to gain insight into the costs associated with the process and its effects on the built form within the resource consenting system.

- **Scale and nature of benefits:** The study results offer a measure of the influence of existing land use regulations on developers' activities. Key findings include:

[18] Also relevant to the cross-cutting benefits associated with high-quality and accessible information.

- The approval processes have become slower over the past decade, with the average timing now ranging from 2 to 9 months.
- Consent processes can be costly, with the most significant expense being attributed to delays. Participants estimate holding costs at around 15%. Another notable cost is the hourly rates charged by councils. Consent fees are typically not a concern. In general, regulations and standards significantly decrease project yields.
- Urban design guidance introduced a high level of uncertainty and subjectivity.
- The built forms of the projects have not undergone significant changes due to interactions with the RM system, possibly because district plans have become more permissive over time.

A New Approach to Urban Planning (Blaschke et al., 2021)

This paper uses international case studies to explore how RM reform can be used to improve opportunities for housing supply while working within environmental limits and delivering improvements in overall environmental quality.

- **Scale and nature of benefits**: The rationale for reform is that NZ's current RM system is not delivering good outcomes for environmental protection or housing supply and affordability. The international case studies showed that:
  - Housing supply and affordability outcomes have not been maintained over time in all cities. This highlights the need to plan and provide for growth on an ongoing basis, rather than relying on past planning.
  - The six studied cities have achieved better long-run environmental outcomes than Auckland, at least in terms of carbon emissions linked to urban form.
- **Features of a system associated with these benefits:** This paper aimed to present lessons for the design of the Strategic Planning Act (SPA) and Natural and Built Environments Act (NBA) under the previous Government's reforms. Key features of a successful plan should:
  - offer 'open-ended', long-term frameworks for growth, with diverse development options and resilience to shocks,
  - deliver transport and infrastructure network provision in advance,
  - employ land use regulations to enable intensification and well as outward expansion,
  - use tools such as pricing to reduce vehicle travel and emissions,
  - encourage well-designed mixed-use urban environments, and
  - protect sensitive areas from development, such as those with ecological significance or biodiversity value.

Better Urban Planning (The New Zealand Productivity Commission, 2017)

This report presents an inquiry into the system of urban planning in NZ with the aim to identify the most appropriate system for allocating land use to support desirable social, economic, environmental and cultural outcome.

- **Features of a system:** The Commission's proposals for a future planning system included:
  - less restrictive land use rules
  - higher-quality and more cohesive plans better linked to infrastructure supply
  - more use of market-based tools and infrastructure pricing
  - longer-term infrastructure and land-use planning based on adaptive management and real-options analysis
  - clear regulations particularly around the system's purposes, objectives, principles and priorities
  - regulatory plans with a more logical structure, as well as more timely, effective, and independent review of their quality
  - a stronger relationship and interface between central and local government.
- **Scale and nature of benefits**: A reformed RM system as recommended, the commission states, will deliver many benefits including:
  - easier, less costly development
  - more access to and more choices of housing
  - better supply of quality infrastructure - at the right time in the right place
  - better protection of the natural environment
  - better plans fasterd
  - mutual benefits to Māori and Pākehā.

Using land for housing (The New Zealand Productivity Commission, 2015)

The commission undertook an inquiry to examine the by-laws, processes, and practices of local planning and development systems.

- **Scale and nature of benefits:** Focusing in urban areas or rapid growth, the report identified leading practices that enable the timely delivery of housing of the type, location, and quality demanded by purchasers.

- **Features of a system associated with these benefits:** The commission identified three main areas were the system need to improve to deliver these benefits: enabling cities to build up or out in response to a greater demand for housing, speeding up land rezoning for housing and development, and targeting lower-cost housing. Elements that could form the basis of a future planning framework that will achieve those improvements are:
  - a formal place in the planning framework for spatial plans
  - a greater role for central government in city planning, including longer-term infrastructure planning
  - a recognised role for price signals in making planning decisions, and
  - a greater ability to develop neighbourhood plans.

Analysis of availability of land supply in Auckland (Ngo & Parker, 2024)

This paper measures how restricted urban land supply is in NZ, and how this has changed over time. To do this, it employs two Auckland empirical studies and one theoretical study.

- **Scale and nature of benefits:** The report presents evidence indicating constraints on the land supply in Auckland. It is estimated that these constraints contribute an additional $378.4 per square meter to the cost of urban land located immediately within the rural urban boundary.
- **Features of a system associated with these benefits:** The report suggests that restrictions on the availability of urban land have an impact on prices, with variations in these restrictions across different areas contributing to this. Furthermore, it indicates that the implementation of the Auckland Unitary Plan probably enhanced land availability, bringing housing prices closer to their production costs. The report emphasizes that the use of indicators, such as sub-regional price-cost ratios, can assist in identifying the specific restrictions that policy should aim to address, as well as whether these restrictions are becoming more relaxed or more stringent over time.

Assessment of the Housing System: with insights from the Hamilton-Waikato Area (The Treasury New Zealand, 2022)

This study looks at the housing and urban development supply and demand in Hamilton and their interaction over time.

- **Scale and nature of benefits:** In the Waikato Region, housing prices increased by 372% from March 2002 to June 2021. In comparison, rents and incomes rose by 114% and 98% respectively, while CPI inflation stood at 49%. The report indicates that the significant shift in the price-to-rent ratio in Hamilton, which resulted in higher housing prices, was influenced by a combination of factors inclusing the global decrease in interest rates, the tax system, and limitations on urban land supply.
- **Features of the system:** The report suggests that implementing reforms to boost land supply, such as the National Policy Statement on Urban Development, could potentially contribute to

steadying house prices. However, the effectiveness of these reforms relies on various factors, including support from local government, infrastructure provision, and decisions made by major landowners. Additionally, such reforms should be accompanied by a better comprehension of the connections between housing and other national, regional, or local objectives.

What Drives Rents in New Zealand? National and Regional Analysis (Bentley et al., 2023)

This paper aims to provide an initial framework to improve our understanding of the factors that impact housing rentals in NZ regionally and nationally.

- **Scale and nature of benefits:** The study found that there are two key drivers of rent inflation at both the national and regional level:
  - The nominal wage inflation, which impact tenants' ability and willingness to pay- a 1% increase in nominal wages leads directly to a 1% increase in new tenancy rents.
  - The relative supply and demand of dwellings, which impact the availability of rental properties – a 1% increase in people per dwelling, leads to a 1.5% increase in rents at the national level.
- **Features of the system:** The purpose of this study was not to offer recommendations for the RM system. However, it emphasises that when land supply is highly restricted, financial factors like interest rates are likely to have a more significant influence on house prices than rents.

AMM modelling of uncompetitive urban land markets (Parker, 2021)

The document presents the findings from the Treasury's spatial equilibrium analysis of uncompetitive urban land markets.

- **Scale and nature of benefits:** The analysis revealed that conventional solutions lead to higher payments to urban landowners. If urban land becomes less competitive in the coming decades, it is likely that landowners will be the ones that will directly benefit from productivity gains.
- **Features of a system associated with these benefits:** The study argues that in order to address the current housing crisis, it is necessary to re-establish competitive urban land markets through the reform of land regulation, long-term growth-enabling planning, and public infrastructure.

Findings

The evidence reviewed points to more effective resource managements systems having potential significant economic benefits through providing for growing and well-functioning urban environments. The role of resource management and, in particular, the planning system influencing the cost, pace and nature of housing is a substantially, and increasingly, well-studied issue. The sources presented above represent only subset of even the New Zealand-based explorations of these matters.

Notable areas of demonstrated potential economic benefit include:

- **Improve housing outcomes and provide for broader economic benefits:** The positive economic outcomes associated with a planning system that provides for a more flexible and enabling approach to residential and commercial development are well-evidenced and demonstrably large. They are suggestive of benefits at both an individual/household and an economy-wide level.

  A combination of overseas and domestic evidence is illustrative of the potential for significant productivity benefits from relocation to more productive areas and agglomeration benefits, consistent with theory. Although the scale of these benefits are less well understood than the direct impacts on housing markets.

- **Efficiency and productivity gains from intensification:** In the case of enablement of denser (or intensified) development, the benefits go further to include not only housing affordability and commercial productivity, but also personal travel time savings and population health. The potential for negative externalities from such development is recognised, but where quantified, minor when compared to benefits.

  While the evidence is consistent on the benefits from enabled intensification and housing enablement more generally, the economic outcomes associated with greenfield development are more nuanced and less well-studied. The evidence is suggestive that a resource management system that results in a more compact urban form would provide substantial benefits, while large rural/urban land price differentials point to substantial social surplus to be gained through enablement of greenfields housing development.

Overall, the literature focuses on to a large extent of benefits associated with greater enablement and generally market-driven approaches to development. Nevertheless, the economic benefit from some reasonable degree of urban planning, in particular to support the availability and reasonable efficiency of infrastructure provision and mitigate the most acute externalities (such as air pollution) is widely recognised, to the point of being taken for granted in much of the literature.

The features of an effective resource management that the evidence suggests are associated with these benefits are:

- a generally enabling approach to planning, particularly for intensification, supported by evidence suggesting that the scale of benefits is likely to be much larger than any negative externalities created
- a focus on long-term spatial and infrastructure planning that provides for efficiency of infrastructure provision
- approaches to greenfields development enablement that balance sufficient competition in rural land supply to depress urban land prices, with appropriate charging mechanisms to avoid higher cost of infrastructure being passed onto the wider resident base.

The most notable gap in evidence are:

- exploration of economically optimal approaches to planning where it is not possible to fully internalise additional costs to greenfields development or other development that has high infrastructure requirements
- research that seeks to compare the efficiency benefits of more restrictive approaches to greenfields development to the impact on overall housing development and affordability
- holistic evidence on the net environmental impacts of more enabling approach planning (beyond current evidenced focused on the emissions benefits of intensification).

B. Effective and affordable provision of infrastructure

Introduction

Infrastructure is at the heart of modern economies and fundamental to economic outcomes. Network infrastructure services including land transport, water services, telecommunications, and electricity transmission and distribution influences the cost of productivity across industries, and the viability of a range of sectors and economic activity. Building and other structures, in particular electricity generation, provide services that make up a large component of the cost basis for a large and growing number of New Zealand sectors.

Infrastructure also has an important role in supporting environmental outcomes, particularly in urban environments through waterwater, stormwater and solid waste management systems. Historically this has provided a key rationale initial roll-out of such infrastructure.

The extent to which infrastructure is able to be delivered in a way that provides better value money influences the overall level of infrastructure services available in the economy, and thus the productivity and growth benefits that can be realised.

Infrastructure capital expenditure and operations is also a major economic activity in its own right with investment alone typically accounting for 5-6% of GDP. The productivity and efficiency of infrastructure development has material economy-wide outcomes.

New Zealand has a large infrastructure deficit, estimated in one case as $104 billion in 2021.[19] However, comparative analysis shows that New Zealand invests a relatively high proportion of GDP into infrastructure compared to other developed countries, but with relatively poor efficiency of that investment.[20] This points to limitations of any additional investment as a solution for closing the gap. This makes the efficiency from our investment in new infrastructure, and our ability to extract greater economic value from existing infrastructure, critical to economic outcomes.

[19] Sense Partners (2021). New Zealand's infrastructure challenge: quantifying the gap and path to close it.

[20] New Zealand Infrastructure Commission. (2021). Investment gap or efficiency gap? Benchmarking New Zealand's investment in infrastructure. Wellington: New Zealand Infrastructure Commission / Te Waihanga.

Resource management systems are central to this. They may influence the form and cost of infrastructure development and thus the economic outcomes that infrastructure can deliver. This is likely particularly the case where they support the securing of land, balance management of externalities with costs to deliver, and levels of service and imposition of direct compliance costs.

Nature-based solutions are sometimes seen as a form of infrastructure which can provide similar or alternative services to built infrastructure. These benefits are generally considered in Section C.

Evidence review

Protecting land for infrastructure - How to make good decisions when we aren't certain about the future (New Zealand Infrastructure Commission, 2023)

This research evaluates investment decision-making methods for site protection in infrastructure projects and analyses case studies in New Zealand.

- **Scale and nature of benefits**: Advanced site protection[21] offers significant advantages, even when the timing or feasibility of a project is uncertain. It can lower land acquisition costs and decrease the likelihood of incompatible developments occurring on preferred infrastructure sites. For example, a study in Australia found that advanced property protection for seven transport projects could save taxpayers approximately $10.8 billion.
    - The report concludes that advanced purchase on average provides for best value for money. Nevertheless, acquisition of options to purchase (most often via designations under the RMA) still led to much lower costs than the third approach, "wait and see." In case studies of education land purchases, the designation approach led to an average land cost of $39 million versus $69 million with a "wait and see" approach. Additionally, a transport-based scenario demonstrated that under a wait an see approach, a reference project would not have been viable at all.
- **Features of a system associated with these benefits:** The report recommends using real options analysis for decision-making and suggests that this will often lead to greater reliance on advanced site protection.[22] The report does not specifically propose changes to the RM system to support this but given the attractiveness of option acquisition through designations as a means to provide optionality, it suggests the need for a system in which designations can be made even under reasonable uncertainty and at low cost.

[21] Ensuring land is available for future infrastructure works though advanced purchase, private purchase-options or designations under the RMA.

[22] Also relevant to the cross-cutting benefits associated with high-quality and accessible information.

Infrastructure consenting for climate targets – estimating the ability of New Zealand's consenting system to deliver on climate-critical infrastructure (Moore et al., 2023)

This research assessed the ability of NZ's consenting system to support the delivery of critical climate-relevant infrastructure.[23]

- **Scale and nature of benefits:** Trends in consenting processes suggest that the consenting system's ability to provide the infrastructure necessary for meeting national climate targets is at risk. It is becoming more expensive, taking longer, and requiring additional resources.[24]
  - The research suggests that failing to meet climate targets due to the inefficiency of the consenting system could be expensive for NZ. The modelling estimates that if the transport sector misses its emissions reduction target by 11% – 15%, the country could face an emissions liability of about $5 to $7 billion by 2050. If the shortfall increases to 29% – 34%, NZ's emissions liability could rise to between $13 billion and $16 billion by 2050.
- **Features of a system associated with these benefits:** The research projections showed that for NZ to meet its net-zero by 2050 targets, the previous Natural and Built Environment Bill should have been fully operational by 2028. Additionally, consenting times would need to be reduced by 50% from 2028.
- **Managing externalities:** The objectives of climate commitments are to mitigate the effects of climate change and to ensure New Zealand's economic, social, and environmental prosperity for the future. However, a costly, high-risk, and time-consuming planning environment hinders the country's ability to implement the necessary infrastructure to meet these commitments.

Integrated land use and transport planning (Crossland et al., 2022)

This research reviews tools and benefits of land use and transport planning integration. It also assesses barriers and opportunities within NZ's legislative framework.

- **Scale and nature of benefits**: Integrated land use and transport planning[25] offers a clear social benefit: improved quality of life. This results from greater access to services, amenities, economic and educational opportunities, and efficient public transportation. Such planning also leads to reduced travel times and contributes to lower greenhouse gas emissions, better public health, and greater social equity – particularly for low-income communities, who gain improved access to affordable housing and reliable transport options.
- **Feature of system**: NZ's complex legislative framework and the high level of discretion given to local councils often result in inconsistent planning and poor coordination. Political processes can

[23] Also relevant to the cross-cutting benefits associated with capital resilience to natural hazards.

[24] Also relevant to the cross-cutting benefits associated with efficient regulatory administration.

[25] Defined as policies and practices that recognise the interdependence of land use and transport, aiming to improve housing availability and affordability, while reducing car dependency through better access to public and active transport options.

also slow progress, and current funding and performance measures tend to support old ways of doing things instead of encouraging new, better approaches. To improve integration, the report recommends a consistent national definition of integration, better public and professional education, and stronger coordination between government agencies. It also highlights the need to simplify the planning system, align regulations more closely, and focus on outcomes like reducing car use.

Infrastructure resources study (New Zealand Infrastructure Commission, 2021)

Infrastructure projects are reliant on significant quantities of physical resources for their construction. In New Zealand, most input costs come from four sources: aggregate[26], cement/concrete, steel, and timber. This study tested whether there are issues with access, price, or quality related to these resources.

- **Scale and nature of benefits:** Transportation costs and resource consent requirements are significant bottlenecks in the supply of natural resources. For example, resource consent conditions can limit quarry operations by restricting their hours or preventing expansion. These conditions can also discourage the development of new quarries or sawmills, creating additional barriers to market entry.
  - The need to source materials from outside the region can result in substantial additional costs. For instance, the study found that transporting aggregate from outside Auckland – which accounts for 30% of New Zealand's total aggregate consumption – incurs extra costs of between $37 million and $163 million per year compared to sourcing locally. This represents up to 1% of Auckland's total construction costs. As a result, resource management decisions can reduce productivity and act as a significant barrier to efficient market operation.[27]
- **Features of a system associated with these benefits:** The Commission recommends developing a national framework for quarrying to eliminate any unjustified differences in the assessment and conditions of resource consents.[28] In the short term, it suggests creating a best practice template for quarry consent applications to reduce the administrative burden on both quarry operators and councils, as well as to support data collection.

The costs and benefits of urban development: a theoretical and empirical synthesis (MRCagney, 2019)

This study assesses the economic impacts of urban planning policies in Auckland, including the various positive and negative externalities associated with urban development.

[26] Aggregate is used in construction as part of concrete applications including in roading and drainage projects

[27] Also relevant to the cross-cutting benefits associated with competitive markets.

[28] Also relevant to the cross-cutting benefits associated with efficient regulatory administration.

- **Scale and nature of benefits**: The study finds that a planning system that ensures sufficient development capacity for residential and commercial activities can help align dwelling sale prices more closely with the marginal cost of supply, thereby enhancing competition in the housing market.[29] However, there is limited evidence on the extent to which specific policy changes improve market competitiveness.
    - In Auckland's case, relaxing building height limits could save Auckland households $933 per year, while a more responsive urban development market could generate $129,000 in consumer surplus per new dwelling. In contrast, greenfield development imposes high infrastructure costs - up to $68,493 per home.
- **Features of a system associated with these benefits:** The study suggests that less restrictive planning regulations can benefit the competitiveness and long-run dynamics of urban development markets. It recommends further research.
- **Management of externalities**: The paper doesn't present punctual options. However, it highlights that enabling policies may result in additional positive and negative externalities associated with housing/business development and city size. These externalities include agglomeration economics arising from proximity, congestion, loss of open space, etc.

National Policy Statement for renewable electricity generation – Regulatory Impact Statement (MfE, 2011)

This RIS assesses the potential impact of implementing the NPS – Renewal Energy Generation (NPS-REG). It points out that the NPS – REG does not impose additional costs on businesses or consumers. While it will impose costs on councils in the short term, mainly due to the need to update plans, the additional policy guidance will reduce uncertainty for generation investors and improve the efficiency of decision-making processes.[30]

- **Scale of benefits:** Renewable energy sources are essential for promoting economic growth, maintaining wealth, and ensuring resilience.[31] The advantages of the NPS – REG mainly come from preventing reductions in renewable generation capacity for large generators, which amounts to a benefit of $13.2 million. Additionally, there are benefits associated with enhanced planning and consenting processes, which total $1 million for small generators and $360,000 for local governments.
- **Features of a system associated with these benefits:** Implementing the NPS – REG to guide local authorities on how renewable electricity generation should be dealt with.

[29] Also relevant to the cross-cutting benefits associated with competitive markets.

[30] Also relevant to the cross-cutting benefits associated with efficient regulatory administration.

[31] Also relevant to the cross-cutting benefits associated with capital resilience to natural hazards.

- **Management of externalities:** Although thermal generation options have favourable economics, they also come with several negative externalities. The report highlights that the NPS – REG provides opportunities for cost-effective reductions in greenhouse gas emissions.

Report of the outcome evaluation of the National Policy Statement for renewable electricity generation (MfE & MBIE, 2016)

The report assesses how effectively the NPS – REG has been implemented and its impact on renewable energy development. **Scale of benefits:** Key findings include:

NPS-REG hasn't noticeably increased certainty for resource consent applicants,there has been minimal impact on councils' planning and decision-making,electricity supply security remains stable, and there is no significant increase in electricity generation capacity.The report recommends evaluating whether the NPS – REG can provide for the continuing development and maintenance of renewable electricity generation activities. Additionally, it highlights that the lack of increase in demand in the electricity market since 2007 has meant that the NPS – REG has not been widely tested through the consenting process.

- **Features of a system associated with these benefits:** The report implies that incentivising the demand for renewable electricity could yield the intended benefits of the policy.
- **Management of externalities:** The policy intended to incentivise the supply of regional electricity partly by reducing uncertainty for generation investors. The policy has not proved effective in doing so.

The cost of consenting infrastructure projects in New Zealand (Sapere for Te Waihanga, 2021)

This report provides a detailed picture of the costs that infrastructure developers face when consenting projects under the RMA.

- **Scale of benefits:** The report suggest that the current consenting system can limit economic growth by imposing significant costs on infrastructure. In New Zealand, infrastructure developers collectively spend $1.29 billion each year getting their projects consented.
    - Furthermore, the system disproportionately impacts small projects and is increasingly becoming more complex – direct consenting costs increased by 70% between 2017 and 2021.
- **Features of a system associated with these benefits:** The report points out that National Policy Statements (NPS) or National Environmental Standards (NES) are not solving complexity and uncertainty but adding to it.[32]

[32] Also relevant to the cross-cutting benefits associated with efficient regulatory administration.

- **Management of externalities:** The report points out that local authorities have failed to consider the wider economic benefits that their infrastructure would deliver to society.

Updating the National Environmental Standards for Telecommunications (NZ Telecommunication Forum, 2024)

This report provides background information on the National Environmental Standards for Telecommunications Facilities (NESTF). It points out that the current NESTF are no longer fit-for-purpose and there is an urgent need of amendment.

- **Scale and nature of benefits**: Telecommunications infrastructure is developing quickly. The report notes that as mobile operators move to 5G technology, around 3,500 to 4,000 new sites will be needed over the next ten years.[33] Under the current NESTF, each of these sites would require a resource consent, costing up to $60 million in total over that period. These costs and delays make it harder to expand the network, which can negatively affect economic growth and access to reliable services for homes and businesses.
- **Features of a system associated with these benefits:** The NESTF need to be updated. It does not reflect current changes in the built environment, including higher housing density and taller buildings, which are now often taller than the towers used to provide coverage. It also does not allow for newer technologies, such as larger batteries, which need more space for storage. To support future growth, the NESTF should provide clear, modern, and less complicated rules that make it easier to install new infrastructure and keep up with changing needs.[34]

The Future is electric – a decarbonisation roadmap for New Zealand's electric sector – (BCG, 2022)

The report highlights why investing in transmission and distribution network infrastructure in NZ has been important and what the focus for the next decade should be.

- **Scale and nature of benefits**: The electricity sector is a vital part of the economy, delivering affordable electricity that is produced with low emissions and is resilient to global energy shocks.[35] The report estimates that 4.8 GW of utility-scale renewable generation will be required by 2030 under a referred pathway. It concludes that the greatest risk to achieving this is the RM system.
    - Modelling indicates that in a mid-range scenario – an environment where every 5th project can no longer gain consent, and the cost of remaining projects increases by 5% – the national cost of renewables development would increase by $791 million over the next 20 years. Further, because this would both increase the cost of renewables but also force

[33] Also relevant to the cross-cutting benefits associated with competitive markets.

[34] Also relevant to the cross-cutting benefits associated with efficient regulatory administration.

[35] Also relevant to the cross-cutting benefits associated with capital resilience to natural hazards.

consumers to pay for more expensive existing generation, the total cost to consumers was estimated at over $3 billion.

- **Features of a system associated with these benefits:** The report proposes reflecting the value of renewable electricity and associated transmission connections in addressing climate change in resource management policy. It suggests doing this by actively promoting lower emissions in consenting processes and ensuring greater cohesion between national policy statements regarding the value of renewable electricity and decarbonisation to New Zealand. It further argues for aligning RM processes, other national and local government instruments, and settings for transmission and distribution investment decisions to the required pace for building.

Understanding the value of meeting the requirements of environmental legislation for roading improvement projects (Reed et al., 2019)

The project explored the value of complying with environmental legislation for roading improvements, offering long-term value insights for transport decision-makers. It presented a framework for measuring the costs and benefits of implementing environmental mitigation efforts. The framework was tested in three case studies.

- **Scale and nature of benefits:** Informed decisions when meeting environmental legislation can result in efficiency gains by roading authorities through resource optimisation and alignment with broader environmental objectives. The scale of this was not quantified.
- **Features of a system associated with these benefits:** The findings from this research highlight the importance of employing a consistent and comprehensive approach to measuring the costs and benefits[36] of implementing environmental legislation, ensuring sustainable and informed outcomes.
- **Management of externalities:** Environmental regulation seeks to mitigate the negative externalities associated with roading infrastructure and development. A clear understanding of the impacts of transport projects is crucial to ensure that mitigation measures result in a net positive outcome.

Futureproofing access to aggregate – economic considerations (McIlrath & Harris, 2024)

Aggregate plays a key role in the provision of infrastructure across NZ. This report provides an analysis of the economic cost associated with interregional imports of aggregate.

- **Scale and nature of benefits:** The role of high-quality aggregate in supporting economic growth is emphasised in this report. However, supply is currently both insufficient and located too far from demand centres. The efficiency of the aggregate market is closely linked to the policies and regulations governing aggregate quarrying, management, and usage.

[36] Also relevant to the cross-cutting benefits associated with high-quality and accessible information.

- **Features of a system associated with these benefits:** The report emphasises the need to develop a framework that balances economic growth with land rights, environmental considerations, and competing social objectives. Current policy frameworks make it challenging for aggregate production to expand, whether through scaling up existing operations or through new quarrying activities. In particular, national policy statements[37] such as the NPS – Indigenous Biodiversity, NPS – Highly Productive Land, and NPS – Freshwater Management have imposed limitations on the market.
- **Management of externalities:** NZ's quarries face strict regulations, creating barriers and high information costs. While necessary due to the activity's nature, the report highlights how the current system affects aggregate market efficiency and its ability to serve New Zealanders' interests.

Measuring the benefits of the Strategic Planning Act (SGS Economics and Planning, 2021)

This project estimated the costs and benefits of implementing the Spatial Planning Act (SPA) and Regional Spatial Strategy (RSS), as supplementary legislation to support the NBA.

- **Scale and nature of benefits:** The project estimated that the Implementation of the SPA is shown to deliver a net present value (NPV) of $176 million at a benefit cost ratio (BCR) of 3.2. The SPA and RSSs are expected to generate present value benefits of $257 million against a present value cost of $81 million. The additional value expected to be created was through a higher level of confidence that the promised benefits[38] of NBA Plans would be realised.
- **Features of a system associated with these benefits:** The assessment recommends implementing the SPA and RSSs. This was intended to ensure national policies, standards and infrastructure priorities are systematically and thoroughly factored into NBA Plans.

Great Decisions are Timely: Benefits from more Efficient Infrastructure Investment Decision-Making (Torshizian & Maralani, 2023)

This study quantifies the cost to society of infrastructure delays, using the Waikato Expressway as an example. Specifically, it employed a Computational General Equilibrium (CGE) model to estimate the downstream benefits of the Expressway.

- **Scale and nature of benefits:** The model's estimates indicate that a lack of early functionality for the Expressway results in a yearly loss of $334 million in economic benefits.
- **Features of a system associated with these benefits:** In order to capture these benefits, the report suggests addressing uncertainties and monitoring the costs of delays in the decision-

[37] Also relevant to the cross-cutting benefits associated with efficient regulatory administration.

[38] Such as environmental safeguarding, housing affordability, urban productivity, efficient infrastructure provision, climate resilient urban development and reduced emissions, amongst other benefits.

making process.[39] This could involve implementing new evaluation and decision-making tools, considering an additional portfolio for 'long-term investment', and applying a an expectation of moving from a system that required the 15-year planning and approval timeframes the authors calculated for the expressway, to one that could be completed in eight years.

Benefits from Auckland road decongestion (Destremau et al., 2017)

This report estimates the benefits of reducing congestion in Auckland.

- **Scale and nature of benefits**: The study indicates that the decongestion benefits to Auckland's current capacity are estimated to range between $0.9 billion and $1.3 billion, which equates to approximately 1% to 1.4% of Auckland's GDP. These benefits stem from various outcomes of reduced congestion, such as the generation of new jobs, higher productivity, time savings for travel, and reduced emissions.

  Features of a system associated with these benefits: The report did not intend to offer recommendations for RM. However, it highlighted the need to explore policy options to alleviate the impact of congestion on Auckland's economy. It emphasised that improved traffic management technologies and intelligent pricing are potential policy initiatives to achieve reduced congestion.

Findings

The evidence reviewed points to resource managements systems having material impacts on the scale, form and efficiency of infrastructure investment. Notable areas of demonstrated potential economic benefit include:

- Competitive and efficient access to materials – a resource management system that provides for easier access to local material can save substantial transport costs. A system that provides for more competitive and nationally consistent access to these resources will reduce barriers to entry, although the impact of this in unquantified.
- Efficient access to land – The extent to which an RM system can facilitate early access to land through acquisition of options (via designation under the current system) can have large impacts on the land cost and thus viability of projects.
- Compliance efficiency – There is good evidence that the direct compliance costs on infrastructure have large impacts for value for money and viability, and thus the economic outcomes from projects. However, the research does not necessarily demonstrate that these costs exceed the benefits that they provide for. This is discussed more broadly in Section D.

[39] Also relevant to the cross-cutting benefits associated with efficient regulatory administration.

  - There is additional evidence that up-to-date and fit-for-purpose standards and national direction could improve the pace of infrastructure roll-out, particularly for network infrastructure and electricity generation.

- Support for non-build and low-build solutions – Urban planning, and the patterns of residential and commercial development it leads to, primarily discussed in Section A, plays a critical role in driving the level of infrastructure investment necessary to achieve a particular level of service. This manifests through greater ability to leverage existing infrastructure as well as potentially lower additional build costs. This is most clearly evidenced in the case of the transport, but likely applies elsewhere including in education, health, and community facilities.

The evidence points to features of an effective resource management associated with these benefits as being:

- Simplified procedures that reduce uncertainty for providers.
- Competitive access to materials to improve project viability and competition.
- Inclusion of consideration of economic benefits when assessing the impacts of projects, standards and national direction.
- An enabling planning environment for intensification, particularly for areas where there is demonstrated capacity in network and vertical infrastructure.
- Responsive and fit-for-purpose national direction and standards that reflect evolving built environment realities.

Notable areas of evidence gaps include:

- Research is largely focused on the direct costs of resource management compliance but does not often translate this into real-world outcomes for consumers and the economy. This would better illustrate the true scale of the opportunity from more effective resource management.
- With the exception of CBAs, most research focuses solely on the costs of compliance or, in some cases, its impacts on the pace of infrastructure roll out. The extent to which these costs are justified or represent an efficient means of managing externalities does not typically feature. This makes it more difficult to determine if the potential economic benefits from the shifts proposed are optimal.
- Research is concentrated on network infrastructure, likely as a result of the more complex interaction with the resource management system. However, vertical social infrastructure, including health and education facilities, comprises a large proportion of infrastructure investment and a deeper understanding of the constraints of these sectors would be beneficial.

C. Productive use of natural resources and natural capital growth

Introduction

Access to natural resources, including land, is a necessary input and binding constraints on most forms of primary production. Beyond this, natural resources are a critical input into many industrial and infrastructure processes, and there are frequently substantial limitations on the extent to which needs can be practically met through importation. New Zealand's goods exports in particular are dominated by sectors directly or indirectly reliant on efficient access to natural resources.

These resources vary widely in form of ownership, ranging from private freehold ownership to full public ownership and many variations in between. Irrespective of the nature of property rights, the strong potential for negative environmental externalities necessitates a role for resource management in regulating the particular use of, or access to, natural resources.

Intrinsically related to utilisation and productivity is the maintenance and growth of natural capital stock. Natural capital stock provides the basis not only for long-term utilisation of natural resources, but also the wider range of ecosystem service that underpin society, many of which can provide market economic benefits. In some cases, a near-term focus may show a trade-off between market economic benefits and environmental outcomes, where a long-run view may show that a particular approach provides net-benefits for both.

Effective resource management is thus necessary to realise the economic benefits from natural resource utilisation, as in its absence, uncompensated externalities may lead to net losses for society or diminished social license for certain productive activity to occur. However, through restrictions and cost inefficiencies, it can also potentially reduce utilisation, productivity, or surplus created through use of natural resources.

Evidence review

Measuring the cost of environmental compliance for Waikato dairy farmers – a survey approach (Macdonald, Rowarth & Scrimgeour, 2015)

This research provides a detailed analysis of the financial implications of environmental regulations on dairy farming in the Waikato region.

- **Scale and nature of benefits:** The costs incurred by Waikato dairy farmers to meet environmental compliance requirements exceeded the average annual economic farm surplus for the region –

the average cost of compliance was estimated as a one-off capital cost $1.02 per kg of milk solids produced – altering farm viability and constraining regional economic growth.[40]

- **Features of a system associated with these benefits:** Regulatory certainty and strong support mechanisms[41] are essential for effective implementation and sustained sector productivity. Farmers raised concerns about the durability of their compliance investments, the high capital costs involved, and inconsistent support across organisations. Options to increase certainty include fixed-term compliance certificates.
- **Management of externalities**: Compliance rules aim to reduce dairy farming's environmental impacts, but issues such as regulatory uncertainty can undermine their effectiveness and farmers' confidence.

Optimising resource management for critical raw materials: a case study of the application of UNRMS with Cornwall Regional Government, UK (Marquis et.al., 2024)

This research examines how Cornwall has benefited from adopting the United Nations Resource Management System (UNRMS) to align its resource development strategies with broader goals of economic revitalisation, technological innovation, and sustainability. The UNRMS framework promotes strategic resource management through low-carbon and advanced extraction technologies, integrated data systems, and waste reutilisation.[42]

- **Scale and nature of benefits**: UNRMS implementation has fostered sustainable tourism, job creation, operational efficiency, and innovation through material recycling and the productive use of mine waste, driving economic growth and maintaining existing wealth.
- **Managing Externalities**: Enhanced data collection and environmental monitoring help mitigate emerging ecological issues. Additionally, new technologies and sustainable mining practices have created high-skilled green jobs, reducing potential social externalities.
- **Features of a system associated with these benefits:** Implementing the UNRMS in areas where natural resource extraction is key to the economy.

Minerals Briefing Paper – Policies for increasing New Zealand's attractiveness for investment in responsible minerals exploration and mining (Straterra, 2014)

The paper outlines several key policies aimed at enhancing NZ's attractiveness for responsible minerals exploration and mining.

[40] Also relevant to the cross-cutting benefits associated with competitive markets.

[41] Also relevant to the cross-cutting benefits associated with efficient regulatory administration.

[42] Also relevant to the cross-cutting benefits associated with high quality and accessible information.

- **Scale and nature of benefits:** NZ has significant untapped mineral resources that could contribute to economic growth.[43] In 2013, the labour productivity of the minerals, oil and gas sector was $333 per hour worked (compared with a NZ average of $48). The sector represented 6.2% of total exports.
  - Furthermore, minerals are essential to the "green economy" because all technologies are made with them.
- **Features of a system associated with these benefits:** The report recommends a plan for promoting minerals exploration and mining in NZ, research funding, integrated and effective regulation, and cost-effective and transparent processes. The following recommendations are provided to enhance the efficiency of the RM system:
  - Introduce reforms to align and streamline regulatory processes for resource consents, concessions, and access arrangements, particularly on public conservation land.
  - Update the Conservation Act 1987 to support business-related activities and enhance regulation of mining access on conservation land.
  - Foster collaborative partnerships between regulators and industry, ensuring transparent criteria, improving inter-agency coordination, reducing compliance costs, and introducing statutory timeframes.
  - Adopt a case-by-case approach to mining approvals, based on the small environmental footprint and high economic value of projects.
  - Classify exploration activities, such as drilling, as permitted activities under the RMA.
- **Management of externalities**: The report doesn't address the management of negative externalities of mineral exploration and mining. However, it points out the need for effective policies that encourage high-tech, safe and environmentally responsible exploration and mining.[44]

Cost and trade impacts of environmental regulations: effluent control and the New Zealand dairy sector (Cassells & Meister, 2001)

The article examines the economic implications of New Zealand's water quality regulations on the dairy industry. Particularly, the requirement for dairy farmers to move toward land-based effluent disposal systems to reduce nitrate levels.

- **Scale of Benefits:** While the environmental control costs linked to water quality regulations in New Zealand's dairy sector are relatively modest – ranging from 2.1% to 3.2% of total milk production costs – they can still affect sector productivity. However, if comparable environmental standards were adopted by other major dairy-exporting nations such as the United States, the

[43] Also relevant to the cross-cutting benefits associated with competitive markets.

[44] Also relevant to the cross-cutting benefits associated with efficient regulatory administration.

European Union, and Australia, New Zealand could strengthen its competitive position in global markets.[45]

- **Features of a system associated with these benefits:** Coordinated international action would reduce the risk of trade distortions and support a fairer, competitive environment.
- **Management of externalities:** In this context, managing environmental externalities effectively requires domestic innovation and international cooperation to ensure that environmental gains are not offset by competitive disadvantages.

Investing in nature – the economic benefits of protecting our lands and waters (US Fish & Wildlife Service & Lant Trust Alliance, 2021)

- **Scale and nature of benefits:** The report highlights that protecting land and water has several economic benefits for the US economy, including:
  - proximity to protected lands, like National Wildlife Refuges, can increase urban home values by 3 – 9%
  - bird watching supports more than 660,000 jobs and $31 billion in employment income
  - one acre of mangroves can be worth more than $15,000 as a nursery for commercial fish
  - protecting natural resources can boost social surplus by increasing urban home values, driving economic growth through the creation of new markets and productive activity, all while preserving the existing wealth of natural and capital assets.[46]
- **Features of a system associated with these benefits:** Innovative water supply systems (such as in New York) and strategic habitat conservation have been key to delivering the benefits.

Regulatory constraints to agricultural productivity (World Bank, 2017)

This report examines how laws and regulations impact a country's agricultural performance.

- **Scale and nature of benefits:** Agricultural productivity is on average higher in countries where transaction costs[47] imposed by regulations are lower, and where regulatory practices align with international good practices.[48]
- **Features of a system associated with these benefits:** Efficient regulatory processes, such as transparent procedures and well-defined property rights, and high-quality regulations.

[45] Also relevant to the cross-cutting benefits associated with competitive markets.

[46] Also relevant to the cross-cutting benefits associated with capital resilience to natural hazards.

[47] The time and financial resources that farmers and businesses invest in order to comply with government regulations.

[48] This includes regulations and standards related to exports, water management, and financial infrastructure.

- **Management of externalities:** The report highlights that due to externalities, uncertainty, informality, and high transaction costs, effective regulations are essential to improve agricultural performance by addressing market failures without creating heavy burdens.

Essential Freshwater Package: benefits analysis (Denne, 2020)

This report explores the advantages of improving water quality in NZ through the Essential Freshwater Package.[49]

- **Scale and nature of benefits:** The economic benefits of this package were assessed to include:
  - cost-saving benefits from reducing health risks associated with contaminated drinking water – a present value of $2,366 million by 2050
  - direct freshwater uses like recreational fishing and boat tours – the report cites 2014 research estimating that Otago's sport fisheries generates $64 – $189 million in consumer surplus annually
  - Strengthening New Zealand's reputation as a leader in environmental sustainability, which is important for the value of its exports. The document cites a study that shows consumers are willing to pay more for products under certain certifications, for example, up to 34% more for certified-safe lamb in China and 15% more in the UK.
- **Features of a system associated with these benefits:** Implementing limits and regulation to the water quality.
- **Management of externalities:** The report highlights that monetised benefits are based on willingness-to-pay analyses, which assume a set of existing rights to discharge contaminants. However, such rights are not established in law.[50] A different set of rights, for example, established rights for the public to have clean, uncontaminated water (unless appropriately compensated for any loss), could be agreed.

Regulatory impact analysis action for healthy waterways (MfE, 2020)

The project evaluated the environmental, social, and economic impacts of proposed freshwater policy changes in New Zealand.

- **Scale and nature of benefits:** The study found that the significant, lasting benefits of the action for healthy waterways package[51] over the long term, will exceed the costs of transition and implementation. It concluded the packages are essential for preserving existing wealth and long-term growth. Benefits include:

[49] The package is a government initiative aimed at improving freshwater management across NZ. It sets water quality and quantity limits.

[50] Rather the RMA states that no person may discharge any contaminant into water unless allowed by a regulation, a plan, or a resource consent.

[51] Specific set of reforms within the Essential Freshwater Package focused on implementing stricter regulations for farming, urban wastewater, and wetland protection.

  - Ecosystem services: Protecting wetlands and streams preserves key services such as flood protection. Safeguarding 28,934 ha of unprotected, fertile wetlands could secure $1.4 billion in annual ecosystem service value.
  - Health benefits: Cuts waterborne illness costs (over $4,100 per household).
  - Tourism boost: Cleaner water supports local economies.
  - Agricultural gains: Higher export value long-term, despite short-term costs.
- **Features of a system associated with these benefits:** Implementing measures to prevent water degradation, enhance its quality, and restore the waterways.
- **Management of externalities:** The package is expected to impose significant costs on farmers. The Ministry is developing an implementation support strategy, which includes financial funding to mitigate these costs.

Community forestry in British Columbia, Canada: history, successes, and challenges (Gunter, 2022)

Community Forest Agreements (CFAs) are licences issued by the Province of British Columbia (BC) to local communities. These agreements, which accommodate a variety of organisational structures, grant holders limited yet significant forest management rights. The rights aim to promote the long-term health of both forests and communities.

- **Scale and nature of benefits:** The economic benefits of community forests differ across locations. They contribute to local job creation and provide direct revenue to the provincial government. Profitability varies depending on how revenues are defined and distributed.
  - As a whole, evidence suggests that community forests can stimulate economic growth by involving more individuals in generating value. In BC, community forests produce 85% more jobs per cubic meter compared to the industry average in forestry, logging, and support services. Additionally, they contribute to rural communities by generating US$1.42 million (CAD$1.85 million) in economic activity.
- **Features of a system associated with these benefits:** Granting the community licenses to manage a specific area of public forest land, partly based on their cultural relationship to the land.
- **Management of externalities:** Community forests have the potential to produce both positive and negative externalities. CFAs mandate community forests to manage and report not only on timber operations but also on ecosystem health, biodiversity, and the preservation of public values.

Water governance in the Netherlands – fit for the future? (OECD, 2014)

This report highlights the long-standing record of Dutch water management and signals opportunities to put the system on a more sustainable basis. The current governance model has been admired for several strong qualities, especially in terms of flood protection, long-term planning, and institutional

resilience.[52] However, the OECD presents a range of reforms to improve the long-term financial sustainability and efficiency of water management.

- **Scale and nature of benefits**: The report emphasises that implementing the proposed reforms would make the water governance system more efficient and resilient. For example, improved water pricing would encourage more responsible use of water and support more effective infrastructure investment. In addition, better coordination between water, spatial, and climate planning policies could support economic growth, as both private and EU investors increasingly look for projects with clear regulations and strong climate resilience.
- **Features of a system associated with these benefits:** Improving water pricing, reforming financing mechanisms, increasing accountability and better integrating spatial, water, and climate planning.[53]
- **Management of externalities:** The reforms also aim to improve how environmental and financial impacts are addressed. This includes ensuring that polluters contribute to the costs of the damage they cause, and that users pay a fair share for the services they receive. These measures would help ensure that the costs of water management are shared more fairly, rather than falling mainly on households or local governments.

Cumulative impact of government policy on New Zealand sheep and beef farms (French et al., 2023)

This report assesses the financial and operational impacts of recent government environmental policies on sheep and beef farming.[54]

- **Scale of Benefits:** Economic benefits are not directly addressed, but the report highlights substantial costs from new policies, which may affect farm profitability. Analysis of four case study farms indicates that, while individual impacts vary, the combined financial burden is substantial. Some farms are incurring one-off costs of $75,000 and ongoing annual costs of $88,000 (in real terms). Additionally, opportunity costs related to stock exclusion measures have exceeded $1.2 million in certain cases.
- **Features of a system associated with these benefits:** The report urges a review of current legislation and emphasises the need for sufficient consultation and implementation time.[55] It sees potential in Freshwater Farm Plans as a practical, tailored approach, provided they are outcomes-based, realistic, and supported by qualified advisors.

[52] Decentralised institutional framework – water boards are responsible for water management and can directly charge polluters.

[53] Also relevant to the cross-cutting benefits associated with efficient regulatory administration.

[54] Policies include the Emissions Trading Scheme, NPS for Freshwater Management and the NPS for Indigenous Biodiversity.

[55] Also relevant to the cross-cutting benefits associated with efficient regulatory administration.

- **Managing externalities:** The report calls for more targeted, flexible regulation that focuses on high-risk areas and recognises proactive environmental efforts by farmers, rather than applying one-size-fits-all rules**.**

Nature-based solutions and their socio-economic benefits for Europe's recovery (Kopsieker et al., 2021)

This report highlights the benefits of nature-based solutions (NbS) in the EU.[56]

- **Scale and nature of benefits:** NbS are expected to play a key role in supporting the achievement of the EU's climate and biodiversity objectives. Their benefits include:
  - Jobs protection and creation: Globally, 1.2 billion jobs in farming, fisheries, forestry, and tourism depend on healthy ecosystems. Europe's largest NbS project, the Emscher Landscape Park in Germany, created nearly 86,000 jobs over two decades.
  - Economic savings: NbS can reduce public costs – air pollution and poor mental health alone cost the EU an estimated EUR166 billion and EUR600 billion annually.
  - Disaster resilience: NbS reduce the risk and severity of natural disasters.[57]
  - Food security: By restoring ecosystems, NbS support sustainable agriculture and long-term food supply.
- **Features of a system associated with these benefits:** The institute urges legally binding ecosystem restoration targets, greater public and private investment in NbS, and improved data to quantify[58] their monetary benefits.

The economic and competitive benefits of environmental policy (Gomola et al., 2024)

This report presents an evidence-based overview of the economic impacts of environmental policies, particularly the European Green Deal, across EU member states. It highlights that although policies may involve some social and economic costs in the short term, strategic investments and regulatory support can lessen the burden of this transformation.

- **Scale and nature of benefits**: Implementing environmental policies is crucial for Europe's long-term resilience and productivity. The report highlights several key benefits:
  - environmental policies drive innovation, with the EU's innovation performance improving by 10% since 2017

[56] The European Commission (European Commission, 2015) defines nature-based solutions as 'Solutions that are inspired and supported by nature, which are cost-effective, simultaneously provide environmental, social and economic benefits and help build resilience.

[57] Also relevant to the cross-cutting benefits associated with capital resilience to natural hazards.

[58] Also relevant to the cross-cutting benefits associated with high quality and accessible information

- these policies support fiscal objectives, contributing to EUR 320.8 billion in environmental tax revenues in 2022
- they also enhance the EU's self-reliance and resilience, with NbS helping to mitigate global risks and reduce dependence on fossil fuels and critical materials
- circular economy principles could create approximately 700,000 new jobs across the EU.

- **Features of a system associated with these benefits:** New Zealand lacks an integrated approach[59] similar to the EU's policy framework, particularly the European Green Deal, which combines sustainability goals and provides comprehensive support to Member States for implementing necessary reforms. To achieve a similar transformation, New Zealand would need targeted investments and regulatory backing.

The value of public conservation land (NZIER, 2024)

The project estimated the value of natural and built capital stocks and flows within DOC-managed public conservation land (PCL).

- **Scale and nature of benefits:** PCL is highly valued by both New Zealanders and international visitors, offering significant economic benefits. The natural and built assets on PCL are worth $134 billion at present. The presence of national parks holds a value of $12.6 billion for Kiwis, while ecosystem services on PCL contribute a net annual value of $10.9 billion. According to the report, these services play a vital role in maintaining environmental resilience.
- **Features of a system associated with these benefits:** The report suggests that the estimated economic values may be understated because some benefits cannot be fully quantified. This is largely due to a lack of publicly available data specific to New Zealand's ecosystems. To effectively assess trade-offs in managing and investing in PCL, it is essential to develop more comprehensive information.[60]

Our land 2024 (MfE & Stats NZ, 2024)

This report explains how land use influences ecosystems and biodiversity, affecting the economy, disaster resilience, and overall well-being, including cultural, mental, and physical health.

- **Scale and nature of benefits:** The report emphasises that protecting natural ecosystems is crucial for economic stability and community resilience. For instance, damage to natural infrastructure leads to high costs and economic losses, especially in land-based industries. Sectors such as the food and fibre sector - a major contributor to exports ($55.3 billion in export revenue in 2023, 75% of NZ's exports)- face risks from soil erosion, pests, diseases, and climate change.[61] Additionally,

[59] Also relevant to the cross-cutting benefits associated with efficient regulatory administration.

[60] Also relevant to the cross-cutting benefits associated with high quality and accessible information.

[61] Also relevant to the cross-cutting benefits associated with capital resilience to natural hazards.

sectors reliant on healthy ecosystems and biodiversity, such as tourism – which contributed $13.3 billion to GDP in 2023 – are also at risk.

- **Features of a system associated with these benefits:** The report recommends regularly monitoring the condition of natural infrastructure and its benefits.[62] It also highlights that green infrastructure projects, such as Te Auaunga, can provide economic advantages. While they may have higher initial costs, they can be more cost-effective in the long run compared traditional built infrastructure.

The start of a conversation on the value of New Zealand's natural capital (van Zyl & Au, 2018)

This report presents information on the quantity, condition, and value of natural capital in New Zealand.

- **Scale and nature of benefits:** New Zealand's natural environment supports major exports such as dairy, meat, wool, fruit, vegetables, fish, and timber.[63] For example:
  - in 2015, fish stocks contributed $776.4 million to GDP, about 3% of the total
  - forestry exports were expected to reach $4.8 billion in 2017.
- The paper concluded environmental indicators appear to be worsening, suggesting that the overall condition of the environment is declining. The author's considered that New Zealand's current economic growth model is reaching environmental limits. Greenhouse gas emissions are rising, freshwater pollution is spreading, and native biodiversity is increasingly at risk.
- **Features of a system associated with these benefits:** The report highlights that data from the System of Environmental-Economic Accounting (SEEA) is improving, but it is still not reliable enough to fully measure the value of natural capital. Investing in better environmental and satellite accounts is necessary to develop a complete national environmental accounting system. NZ could also fully adopt a framework similar to the UK's National Ecosystem Assessment Follow-On (UK NEAFO), which provides useful tools and information to help decision-makers understand the wider value of ecosystems and the services they offer.

'Total Economic Value' of New Zealand's land-based ecosystems and their services (Patterson & Cole, 2008)

This research estimates the total economic value of New Zealand's land-based ecosystems and their services and presents recommendations for policy making.

- **Scale and nature of benefits:** According to the report, New Zealand's land-based ecosystem services contributed $57 billion to human welfare, which is equivalent to 27% of the country's

[62] Also relevant to the cross-cutting benefits associated with high quality and accessible information.

[63] Also relevant to the cross-cutting benefits associated with competitive markets.

GDP. An analysis of these services reveals the following main categories and their respective values:

  - supporting services amounted to $22 billion
  - regulating services contributed $15 billion
  - provisioning services were valued at $30 billion
  - cultural services reached $1 billion
  - passive values accounted for $12 billion.

- **Features of a system associated with these benefits:** Key recommendations from the authors include improving New Zealand-specific data, especially for non-provisioning services and passive values,[64] and being cautious in adapting international data due to differing cultural and ecological contexts. The authors highlight the need to test valuation assumptions with case studies, address methodological issues like the use of single-market values, and recognise the limits of neoclassical valuation, which tends to underestimate ecosystem value due to its anthropocentric and present-focused nature. They advocate for broader valuation approaches, including biophysical and energy-based methods, to better capture intrinsic and long-term ecosystem values.

Water management in New Zealand – a roadmap for understanding water value (Kaye-Blake et al., 2014)

This paper explores a range of water management issues in New Zealand, with a particular focus on choices around freshwater allocation.

- **Scale and nature of benefits**: The report does not attempt to quantify the benefit from improved water allocation, but suggests the potential for improved competition, productivity, and social surplus through alternative methods to allocation.[65]
- **Features of a system associated with these benefits:** Reform of the allocation method away from a first-in, first-served approach, and applying various possible approaches to more efficiently price and allocate freshwater.

Can Norway be a role model for natural resource abundant countries? (Cappelen & Mjøset, 2012)

This paper explores how Norway transitioned from being a relatively low-income nation in the mid-20th century, to one of the world's wealthiest economies, primarily driven by its oil sector. The Norwegian Government has played a crucial role in managing natural resources through extensive regulation and strategic policies. Key policies of Norway's success include:

[64] Also relevant to the cross-cutting benefits associated with high quality and accessible information.

[65] Also relevant to the cross-cutting benefits associated with competitive markets.

- **The Oil Fund**: Surplus oil revenues are invested internationally, generating long-term returns to ensure wealth for future generations.
- **Budgetary Policy**: Government spending from the Oil Fund is carefully controlled, limited to the expected real return, demonstrating fiscal discipline.
- **State Ownership**: Norway maintains significant state ownership in major oil and gas companies, securing control over critical resources and profits.
- **Scale and nature of benefits:** Norway's approach has facilitated both economic growth and environmental sustainability.
- **Features of a system associated with these benefits:** Strategic extraction of natural resources accompanied by fiscal discipline, long-term wealth management, and inclusive economic growth.[66]
- **Managing Externalities:** Norway has implemented key measures to mitigate the negative externalities of the activity. They include a special tax on the oil and gas sector, targeting profits above the normal return. It has also limited the use of public oil revenues to fund social welfare programs, such as healthcare, education, and infrastructure development.

Policies for the future of farming and food in the Netherlands (OECD, 2023)

This paper explores and provides policy recommendations to the Dutch food, agriculture, and horticulture sectors. These sectors are characterised by being efficient, productive, and export-oriented, with high value added throughout the food chain and a significant share of global exports across many products.

- **Scale and nature of benefits:** The Netherlands has the highest agricultural production per hectare in the world. This is partly due to continuous innovation and the use of advanced technologies, as well as the country's efficient farm-to-port system, which lowers costs, encourages exports, and supports overall economic growth.[67]
- **Features of a system associated with these benefits:** The level of productivity and efficiency of the sector has been achieved through a range of policies, including investment in innovation and technology, robust infrastructure and strategic geographical positioning, and constant collaboration between government and farmers.
- **Management of Externalities:** The sector hasn't successfully balanced productivity with sustainability through innovation. The OECD recommends clearly defining environmental limits and embedding them into regulations and policies to reduce uncertainty for producers. It also calls for a comprehensive data strategy to monitor and improve performance, the education of

[66] Also relevant to the cross-cutting benefits associated with competitive markets.

[67] Also relevant to the cross-cutting benefits associated with competitive markets.

farmers and producers, and the promotion of innovation that enhances environmental outcomes.[68]

Learning from 20 years of Payments for Ecosystem Services in Costa Rica (Porras et. al., 2013)

Costa Rica's forest cover has increased to over 50% of the country's land area, rising from a low of just 20% in the 1980s. This report reviews Costa Rica's Payments for Ecosystem Services (PES) programme, which has been instrumental in the country's forest restoration efforts.

- **Scale and nature of benefits:** The PES program has directly benefited people by providing direct payments and creating new jobs in sectors such as infrastructure, microbusinesses in the timber industry, and ecotourism. Indirectly, it has also promoted healthier ecosystems. Healthy ecosystems are crucial for enhancing resilience to climate change and serve as vital resources for agriculture, hydroelectricity generation, and the tourism industry.[69]
- **Features of a system associated with these benefits:** Implementing financial mechanisms to promote ecosystem conservation. The report highlights that the PES can improve its impacts on the environment and on people by, for example, keeping indicators for environmental impact simple through careful planning,[70] gathering data for continuous programme evaluation, and considering differentiated payment levels to increase cost-effectiveness.
- **Management of externalities:** The program aims to tackle market failures such as pollution and carbon emissions by implementing a market mechanism. However, the report highlights that it may also have negative effects on employment. For instance, if forest protection leads to the abandonment of agricultural lands, it could result in a loss of jobs that those lands would have generated.

Findings

The evidence base suggests the *potential* for substantial economic benefits from more effective resource management. This potential emerges in the following areas:

- **Maintenance and growth of natural capital and ecosystem services through environmental protection**: There is a substantial and growing literature in New Zealand and globally on valuing natural capital and ecosystem services. Most of this focuses on valuing economic activities and industries dependant on existing levels of ecosystem services. Scope, methods, and estimates of these values vary widely, but demonstrate that changes in natural capital and ecosystem services can have nationally-materially impacts on economic outcomes.

[68] Also relevant to the cross-cutting benefits associated with high quality and accessible information.

[69] Also relevant to the cross-cutting benefits associated with capital resilience to natural hazards.

[70] PES uses land as a unit to account for 'bundled' ecosystem services (an input-based approach) rather than accounting for its components, such as particular species or units of carbon captured.

However, these studies have generally not sought to determine the extent to which resource management policy and practice influences these values. It is difficult to determine from the evidence either how these values have been impacted from historical resource management practice, or how they would be affected by alternative approaches. While the potential of economic benefits from more effective approaches appears clear, the actual nature and scale of these benefits is poorly understood.

- **Compliance impacts on primary production:** There is a reasonable evidence base that seeks to quantify the impacts of resource management on primary production, with the greatest domestic focus on the dairy and meat sectors. There are also some demonstrated impacts from restrictions of resource extraction. The assessed impacts range from relatively minor, to significant and fundamental impacts on the viability of some operations. However, these largely studies do not generally contend with the benefits to natural capital and ecosystem services that these regulations support (with the exception of some approaches at cost-benefit analysis, see below).

  Hence, while these studies provide some indication of the additional producer surplus and economic activity possible from a less restrictive resource management approach, they generally don't help us to determine whether such an approach would be more effective, even from a limited market-economic perspective, much less a net societal impact perspective.

- **Efficiency in resource allocation:** Several sources point to the economic inefficiency of non-market-based approaches to natural resource allocation. These focus most significantly on water, where the domestic and international literature points to impacts on allocative efficiency of approaches such as "first-in, first-served". Instead, evidence suggests that economic benefits are better achieved by alternative market- or price-based approaches, as it encourages increased competition, more efficient allocation, and associated productive gains. However, they do not generally quantify these benefits.

Overall, understanding of the potential economic benefits in this area from more effective resource management, and how to achieve them, is limited. This is due to the lack of direct consideration of how different approaches to environmental protection impact the value of natural capital and ecosystem benefits. This gap exists in both studies that assess the value of these areas, and in those that focus on the cost to industry of such protections.

The exception to this is in certain cost-benefit analysis associated with particular regulatory change. While these studies are instructive, they are also reliant on large assumptions about the nature and scale of the impact that will occur, rather than assessing the actual balance of cost of benefits from an observable system.

The apparent gap in the evidence base is around research focused on *existing systems*, that seeks to understand *both* the impact on economically productive activity and on the level of natural capital and ecosystem services. Robust environmental data and resource valuation will likely be critical to filling this gap.

As a result, it is difficult to point to particular approaches to resource management consistent with achieving economic benefits in this area. However, it is clear that a shift towards more market-based approaches to resource allocation, is a feature associated with improved economic outcomes.

Additionally, several studies point to a more enabling consenting regime, including the use of more permitted activities, as being consistent with greater direct economic benefits. In principle, where this can be done with an acceptably small impact on natural capital, this will represent a net increase in economic benefits. However, the evidence reviewed does not provide a clear picture of where this is likely to be the case.

Some research points to the potential trade-off between the benefits of predictability that comes with bright-line standardised rules versus the opportunity cost of failing to provide for innovation and benefits maximisation on an individual basis. It is difficult to generalise from the evidence about how this balance can be optimised.

D. Efficient regulatory administration

Introduction

Within any regulatory system, more efficient administration has the potential to improve economic outcomes. This occurs most clearly through the directly saved costs which manifest in increased social surplus for a given activity, and improved actual productivity.[71] Resource management systems touch such a wide range of economic activity, that any improvements in efficiency are likely to have economically material impacts.

We have also included in this section several studies that assess whole-of-system impacts of resource management approaches that do not naturally fit within any other section. Many of these studies include a substantial focus on efficiency of administration and associated costs. However, they also consider topics covered in other sections, which have not been included in our discussion of key findings relating to efficient regulatory administration covered here.

Evidence review

Economic impact analysis of the proposed resource management reforms (Castalia, 2025)

This report estimates the net benefits of the currently proposed RM in New Zealand reforms by comparing the costs of the current RM System to the estimated costs Blueprint Reforms. The assessment focused on administrative costs, compliance costs, and opportunity costs.

[71] It is not immediately clear whether reduced administrative costs will always manifest in improved measured productivity, but to the extent that a given activity is requiring less resources than it otherwise would, this is clearly improved productivity in an economic sense.

- **Scale and nature of benefits:** The Blueprint Reforms are estimated to significantly reduce administrative and compliance costs. They are also likely to reduce opportunity costs. However, there is a lack of evidence and estimates of these costs.

Table 1: Benefits summary

Cost	RM system NPV costs	Blueprint Reforms NPV
Administrative costs	$10,741,000,000	$7,204,000,000
Compliance costs	$22,174,000,000	$10,912,000,000
Opportunity costs	There is some qualitative and limited quantitative analysis of the RM system's opportunity costs, but much of it doesn't directly quantify them.	The Blueprint Reforms are pending legislation, making it hard to assess regulatory changes and their indirect effects.

The underlying source of the significant majority of these benefits is the reduced assumed number of consents required under the reformed system. Within this, by far the biggest single source of benefit is reduced cost to users of participating in consenting processes, the source of $8.8 billion (NPV) alone, while meeting consent compliance requirements is expected to require $2.2 billion (NPV) less is costs to users.

While the approach breaks down how the reduction in consenting manifests across a number of areas, this is ultimately the key evidential conclusion of the study in relation to benefits of reform. There are other sources of efficiency identified but the calculated benefits are minor in comparison to those driven by increasing permitted activities.

- **Features of a system associated with these benefits:** The report suggests that from an administrative and compliance perspective the Blueprint Reforms represent an improvement on the status quo system particularly with respect to reduce volume of consenting required. However, the report doesn't quantify system performance impacts associated with different approaches to administration and reduced compliance burdens.

Supplementary Analysis Report: the new resource management system (MfE, 2022)

This report presents an assessment of the estimated costs and benefits of the proposed reformed RM system reforms under the previous Government, relative to the status quo. While substantively different from currently proposed reforms, the analysis remains relevant in understanding scale of potential benefits.

- **Scale and nature of benefits:** The new system, well-implemented, was expected to deliver significant benefits. The establishment costs and new ongoing costs ($3.891 billion) over the 30-

year assessment period were much less than even the most conservative estimate of monetised benefits. Benefits were calculated as a present value of $10.039 billion. These benefits were not limited to market economic benefits.

  - The expected higher monetised benefits included improvements in housing supply (present value $2.2 billion) and enhanced infrastructure resilience (present value $3.125 billion).[72] [73]

- **Features of a system associated with these benefits:** Key changes to the RM system was expected to deliver significant benefits to NZ. Key reforms introduced through the NBA, SPA and SAA include:

  - the introduction of environmental limits and a positive, outcomes-based approach
  - the reduction of barriers to consenting and development. The consenting process will be streamlined by simplifying plans and making rules clearer and more consistent across regions
  - a stronger focus on directing growth into lower-risk areas, through coordinated regional spatial strategies.

Understanding the productivity impacts of the resource management system (Treasury, 2021, unpublished)

This assessment evaluates the RMA in terms of productive, allocative, and dynamic efficiency.

- **Scale and nature of Benefits:** The report does not provide estimates of benefits, however, it provides a scale for potential productivity improvements from reforming the legislation. Some key improvements include:

  - Productive Efficiency: The RMA consenting process is slow and costly.[74] Approximately 16% of consents take over 100 days to process. The total annual cost of the RMA process is estimated at $1.219 billion.
  - Allocative Efficiency: Resource allocation under the RMA is often inefficient. A first-in, first-served approach is used instead of market-based mechanisms, such as auctions. This leads to suboptimal allocation and reduced economic efficiency.
  - Dynamic Efficiency: The RMA imposes costs on housing and labour markets. For example, in Auckland, the house price-to-construction cost ratio is nearly 3, well above the threshold of 1.5, which signals land supply constraints and escalating house prices. The system also creates regulatory uncertainty by categorising developments as "discretionary" or "non-complying" giving councils wide discretion, which can deter investment and innovation.

[72] Also relevant to Resilience to Natural Hazards

[73] The value of infrastructure resilience benefits were based on an assumption of all development and therefore associated infrastructure being directed toward low risk areas.

[74] Also relevant to the cross-cutting benefits associated with efficient regulatory administration.

Findings

When compared to the other benefits discussed in this report, the benefits associated with efficient regulatory administration are straightforward conceptually, and very amenable to quantification. Economic benefit manifests through direct cost savings to local government, central government and system users. This supports greater social surplus and effective productivity. Resources not devoted to regulatory administration and compliance can be redirected to other economically productive activities.

The evidence provides, most notably in the recent CBA of the Blueprint reform proposal, an indication that these direct savings are potentially very large. The research suggests that the significant majority of potential savings results through the reduction in the number of activities required, rather than efficiencies within those activities (although both can occur). This is the case whether at the level of central and local government planning and direction-setting processes, or at the level of individual consent granting.

This suggests the primary path to reduced compliance and administrative costs from more effective resource management is likely through reduction in high-cost activities, in particular greater permitted activities, than through marginal efficiencies within activities.

Research in this area could be strengthened by more directly engaging with the likely consequences of any administrative or compliance reductions, noting that assessing and monetising these is generally far more challenging and resource intensive than assessing direct cost savings.

E. Resilience to natural hazards

Introduction

Natural hazards, including natural disasters, represent a significant source of economic risk and realised loss. Natural hazards can lead to a loss of physical capital and if not fully insured (or reinsured) a consequential loss in financial capital. Although responses may ultimately involve additional productive activities, on net this is unlikely to be economically beneficial, particularly once accounting for long-term impacts on insurance rates. Moreover, there is substantial lost economic activity while assets are being repaired or replaced.

Due to the imperfection of insurance markets, much natural hazard risk is poorly priced and often not fully internalised into the asset owner. In practice, Governments often act as de facto insurer of last resort and bear residual risks from assets owned by private individuals and businesses as well as their own, often uninsurable assets. Significantly, approaches to development and natural resource utilisation have impacts not only on the natural hazard resilience of one's own capital, but often that of others. These externalities are often unpriced.

Effective resource management can influence resilience to natural hazards, and thus maintenance of physical, natural and financial capital. They can theoretically do so efficiently, by mitigating or

internalising potential externalities and limiting genuinely net-negative value development where this is impossible. However, there is also the potential to do so in an economically counterproductive manner, in which development with an acceptable and adequately managed risk profile is unable to proceed. The balance of these effects may determine the extent to which a resource management system's management of natural hazard risk is ultimately supportive of economic outcomes.

In informing the scale of risk associated with natural hazards, and thus the potential economic benefit associated with a more effective approach to management of these risks, a number of studies presented earlier in this report, including relating the value of natural capital are relevant.

Evidence review

Does adaptive management of natural resources enhance resilience to climate change? (Tompkins & Adger, 2004)

This study examines how adaptive, community-based resource management strengthens resilience in both human and ecological systems. It highlights the importance of resilience-building strategies in addressing unpredictable environmental risks. A case study from Trinidad and Tobago shows how local management fosters networks that help communities endure extreme events, while preserving essential resources and ecosystems.

- **Scale and nature of benefits:** Community-based resource management is essential for preserving existing wealth, particularly in areas that are more vulnerable to climate change.
- **Features of a system associated with these benefits:** Formalised co-management arrangements (vertical linkages and shifts in rights and responsibilities from government to local resource users) in the resource management processes.

OECD Economic Surveys: New Zealand (OECD, 2024)

This report reviews the economic situation and policies of New Zealand.

- **Scale and nature of benefits**: The OECD survey states that the RMA has struggled to manage population growth, and climate change mitigation and adaptation in land-use planning and infrastructure. The scale of this challenge is evident in the costs of storm events in Auckland and Cyclone Gabrielle in early 2023, with damage to physical assets estimated at NZD 9 – 14.5 billion. Moving towards sustainable growth requires macroeconomic and policy changes.
- **Features of a system associated with these benefits:** The report highlights widespread agreement that the RM has not been working and argues that climate change will make the price of failure even higher. Some reforms will still be required, including:
  - democratic accountability – publicly elected councils should be the primary planning authority
  - coordinated spatial planning – there is a need to align national and local planning efforts

- national direction, including defined, broad spatial planning parameters
- simplified appeals process
- expanded revenue tools for local councils
- data-driven planning and decision-making.

Infrastructure for a climate-resilient future (OECD, 2024)

This report emphasises the need for substantial investments to safeguard infrastructure systems.

- **Scale and nature of benefits:** The OECD assessment highlights that investing in climate-resilient infrastructure delivers significant economic returns and cost savings. Between the 1970s and 2010s, average annual economic losses from climate-related disasters increased dramatically – from USD 198 billion to USD 1.6 trillion. Major studies have found that every dollar invested in resilient infrastructure is estimated to generate approximately four dollars in benefits, highlighting the strong economic case for proactive investment.
- **Features of a system associated with these benefits:** To unlock the potential of climate-resilient infrastructure, the OECD recommends:
  - clearly assessing climate risks to infrastructure assets and operations
  - integrating those risks into infrastructure planning and decision-making processes
  - securing adequate financing through diverse channels.

Lifelines – the resilient infrastructure opportunity (Hallagatte et al., 2019)

This report highlights that resilient infrastructure is pivotal for unlocking economic opportunities.

- **Scale and nature of benefits:** Strengthening infrastructure against natural hazards is a highly cost-effective investment:
  - the benefit cost ratio is > 1 in 96% of scenarios, > 2 in 77%, and > 6 in 25%
  - globally, the NPV of resilient infrastructure investments exceeds USD2 trillion in 75% of scenarios and USD4.2 trillion in 50%
  - benefits increase under climate change scenarios.
- **Features of a system associated with these benefits:** The report recommends enforcing infrastructure regulations, securing funding for maintenance, and integrating risk assessments into planning. Resilience should be built into standards, supported by provider incentives, risk-based land use, quality data, and transparent financing.

Estimated number and valuation of residential properties within inundation/flood zones impacted by climate change (Storey et al., 2025)

This report estimates the number and total value of New Zealand residential properties likely to experience at least one damaging event between 2026 and 2060, as extreme weather events intensify due to climate change.

- **Scale and nature of benefits:** In 2023, approximately 219,000 residential properties were located within inundation or flood zones, representing a combined property value of $180 billion. This figure illustrates the potential scale of economic losses if action is not taken to mitigate and manage flood risk.
- **Features of a system associated with these benefits:** The report doesn't provide specific RM recommendations. However, it underscores the importance of integrating flood mitigation planning and data analysis into resource management to enhance resilience and sustainability.

How effective are resilience-focused policies? A literature review (Pells, 2024)

This literature review looks at how well certain policies work to make New Zealand's economy stronger and better able to handle shocks or changes that could affect it the most.

- **Scale and nature of benefits:** The research highlights that the ability of economies to withstand and recover from shocks – such as global recessions, supply chain disruptions, natural disasters, and climate change – largely depends on effective policy settings. Barriers, such as limited information, short-term decision-making, and weak regulatory coordination, can hinder resilience efforts. International examples, such as Japan's experience following the 2011 earthquake and tsunami, demonstrate the benefits of resilience-focused planning.
- **Features of a system associated with these benefits:** Areas of improvement for New Zealand's resilience policy settings include strengthening governance, with clearly defined roles for central and local government. Local land-use planning should avoid high-risk areas such as floodplains and fault lines and focus on infrastructure that is durable and adaptable. Public investments must take risks into account, supported by strong planning regulations, and the disclosure of climate-related risks to inform decision-making.
    - The report also highlights the importance of improving data and tools, including the development of a reliable and comprehensive risk information system. Policies should ensure that risk information is accessible, standards are clear, and investments are well-informed. Building spare capacity into infrastructure, as demonstrated by Japan's transport system after the 2011 disaster, can also significantly reduce disruption during major events.

Protecting New Zealand from natural hazards (Insurance Council of New Zealand, 2014)

This report outlines a framework, and a set of initiatives designed to reduce New Zealand's exposure to natural hazard risks.

- **Scale and nature of benefits:** New Zealand is one of the world's most vulnerable countries to natural disasters in relation to its economy. On average, natural hazards are expected to cost nearly 1% of its GDP each year, or around $1.6 billion. Without risk reduction measures, the cost of natural disasters in NZ will rise, driven by factors like climate change, population growth in vulnerable areas, and the potential for multiple, compounding hazards.
- **Features of a system associated with these benefits:** The report presents a framework for reducing New Zealand's vulnerability to natural hazards. Implementing this framework requires high-level coordination across multiple sectors, with strong leadership and governance from the central government to align national policies with actions from local government, businesses, communities, and individuals. Key actions to better protect New Zealand from natural hazards include:
  - creating a dedicated agency within the Department of Prime Minister and Cabinet (DPMC) for coordination
  - developing a national risk management plan
  - aligning legislation
  - requiring local authorities to assess and address increasing risks.
- The report also highlights the importance of improving research, establishing a national hazard database, providing clear risk guidelines, educating the public, and ensuring long-term funding for resilience initiatives and affordable insurance.

Natural hazards-related public spending in New Zealand (White et al., 2025)

This report examines central government spending on natural hazards to assess how well it is tracked and understood, identify key areas of focus, and analyse how spending patterns have evolved over time.

- **Scale and nature of benefits:** Between 2010 and 2025, central government spending on natural hazards is estimated at a minimum of $33.1 billion, comprising $18.4 billion in appropriations and $14.1 billion in public insurance spending. Spending on natural hazards is increasing and is largely dominated by recovery spending, especially following major events such as the Canterbury earthquakes and the 2023 North Island weather events. Natural hazard-related appropriations account for around 1.06% of total government spending and average 0.33% of GDP annually, with significant peaks in high-impact years. The wider cost of recovering from natural hazards has been estimated to be 4.3% of GDP per year.

- **Features of a system associated with these benefits:** Given the significant and growing costs, the research highlights the need to improve how natural hazard spending is reported and monitored across government. Additionally, clearer, and better-categorised information could support a better understanding of the value and trade-offs between different types of expenditure.

Findings

There is a reasonable evidence base estimating the nature and scale of New Zealand's exposure to natural hazards, as well as the economic consequence in terms of loss of physical capital, disruption of economic activity, and direct public expenditure. This includes backwards-looking research on actual costs incurred, and forward-looking assessments of the value of physical and natural capital exposed to future risk, including consideration of changing risk-profiles as a result of climate change.

There costs are very large, and only partially mitigated in the short-term by inflows of capital from overseas reinsurance. In the long-term, it can be reasonably assumed that New Zealanders will ultimately bear these costs – whether through increased insurance premiums, or uncompensated losses for uninsured or uninsurable assets. Insurance premiums reduce social surplus and reduce the volume of economically viable capital investment. Uncompensated losses represent an even more significant direct reduction of economic outcomes through the loss of capital and the returns it provides.

Given the prevalence of natural hazard risk in New Zealand, their economic impacts, and the significant role of resource management in shaping the exposure of both the built and natural environments to these hazards, it is notable how little research appears to exist on the relationship between resource management approaches and the outcomes of natural hazards, including economic impacts.

The primary attempt to study this issue that we identified was the cost-benefit analysis on previous resource management reforms, which estimated that up to $9.8 billion in benefits from improved infrastructure resilience could be achieved. However, this appears based on a modelled assumption of all development occurring in low-risk areas, a policy choice not demonstrated to be practicable or efficient.

To illustrate this evidence gap, we consider the paper discussed above (Pells 2024) on the effectiveness of resilience policies. This paper reviewed over 100 sources to improve understanding of policies that are effective for ensuring economic resilience with a substantial focus on natural hazards. However, not a single source specifically sought to address the extent to which New Zealand's approach to resource management has contributed to improving economic resilience or how alternative approaches would improve on the status quo. Nor does the Productivity Commissions' (2024) Inquiry into Improving New Zealand's economic resilience mention resource management or the RMA.

Resource management systems must navigate complex trade-offs between managing uncertain externalities related to long-tail natural hazard risk, and enabling investment and economically

productive activity. Unfortunately, the evidence base as reviewed does not provide for a clear view on what characterises more effective approaches in this area or a reliable scale of potential benefit.

F. Competitive markets

Introduction

Competition plays a well understood role in shaping economic outcomes. Higher competition is associated with improved efficiency, innovation, and price competitiveness. Low levels of competition in New Zealand have long been cited as a factor reducing New Zealand's productivity levels. However, direct regulation of competition often sits outside of resource management systems in many jurisdictions, including in New Zealand.

Nevertheless, all regulatory systems that influence the ease and manner of establishing or expanding a business will likewise influence the degree of competitions in specific sectors and the economy as a whole. For resource management systems, the specific features that influence this may relate to:

- cost of compliance of entry of new businesses into a market
- land use restrictions
- allocation of natural resources
- uncompensated externalities affecting competitive neutrality.

The majority of relevant studies on this issue have been discussed above within the three benefit domain area sections.

Evidence review

Market study into the retail grocery sector (Commerce Commission NZ, 2022)

This report sets out the findings of the Commerce Commission's market study into the retail grocery sector and its recommendations for change.

- **Scale and nature of benefits:** The Commission emphasises that the ease of finding and acquiring suitable sites at affordable prices is likely to be a key factor in the entry and expansion of supermarkets. Current planning regulations significantly restrict location options and site availability. For instance, district plan zoning regulations can limit the number of accessible sites for store development, and resource consents impose significant costs to new stores. Additionally, the RMA allows parties to oppose their competitors' resource consent applications for anti-competitive reasons. In light of this, changes to the RMA are necessary to enhance competition in the sector, ultimately benefiting society as a whole.

- **Features of a system associated with these benefits:** The commission suggested preliminary changes that could improve competition in the sector, including:
  - Improving clarity over the effects of section 104(3)(a) of the RMA, which states that a consent authority must not have regard to trade competition, and other equivalent provisions. The commission believes that the advantages of competition and consumer choice are not consistently or systematically evaluated in the application process. Additionally, these factors are not reliably integrated into the plans and procedures that support individual applications.
  - Changing the category under which supermarket activity is classified, which will significantly affect the difficulty of obtaining resource consent.[75]
- **Management of externalities:** The Commission highlights that while decision-makers are in some instances considering the adverse flow-on effects of competition, they are neglecting to consider the associated benefits. This oversight suggests that the current system lacks comprehensive management of externalities, resulting in imbalanced decision-making processes.

The impacts of environmental regulations on competitiveness (Dechezlepretre & Sato, 2017)

The paper reviews empirical literature that attempts to quantify the effects of asymmetric environmental regulations[76] on key aspects of firms' competitiveness in the US.

- **Scale and nature of benefits**: The study finds that strict environmental regulations may have modest, short-term negative effects on trade, employment, and productivity, particularly in pollution- and energy-intensive sectors. Research suggests that total factor productivity (TFP) declines by 4.8% for polluting plants in strictly regulated countries relative to plants in weakly or unregulated countries.
  - However, such regulations can drive innovation. For instance, the EU Emissions Trade Scheme increased low-carbon innovation by 30% among regulated firms. In the long term, environmental regulations can also support economic growth by attracting new businesses, creating jobs, and reallocating resources toward higher-value, sustainable activities.
- **Features of a system associated with these benefits:** Implementing asymmetric environmental regulations that generally require polluting facilities to undertake abatement activities and may impose costs on businesses.
  - **Management of externalities:** Pollution is a classic example of a negative externality. Environmental regulations aim to correct the market failure where pollution costs are ignored.

[75] The Supreme Court stated that relevant "retail distribution effects" may be taken into account when they are "significant". Decision-makers may choose to decline a consent if it would lead to a significant downturn in economic activity in existing retail (Commerce Commission, 2022).

[76] Regulations that vary in their stringency across different firms and sectors.

Regulatory compliance burdens: literature review and synthesis (Cordes et al., 2022)

This report presents existing literature on the economic impacts of regulatory compliance burdens on US businesses and introduces options for reducing these burdens. The paper highlights that local land use regulations – such as zoning laws, building codes, and building permits – impose costs on businesses and act as barriers to entry for smaller or newer firms, reducing market competition.

- **Scale and nature of benefits**: The reforms (mentioned above) are expected to support economic growth by reducing regulatory friction. Additionally, by increasing land and housing supply and improving the efficiency of the resource consent process, the reforms have the potential to generate significant social surplus.
- **Features of a system associated with these benefits:** The research recommends a reliance on performance or market-based tools to achieve regulatory goals, reducing red tape regulation, and streamlining compliance using digital tools and technology.

The innovation and performance effects of well-designed environmental regulation: evidence from Sweden (Weiss & Anisimova, 2018)

This paper investigates how Sweden's environmental policies have impacted firms in the pulp and paper industry.

- **Scale and nature of benefits:** The research indicates that well-designed regulations have induced innovation offsets through improved energy efficiency, leading to both environmental benefits and enhanced firm performance. Flexible, dynamic regulation can lead to economic growth in industries by incentivising innovation that improves energy efficiency.
- **Features of a system associated with these benefits:** Swedish environmental regulation is built on two constituting pillars: command-and-control (CAC) regulation and regulation via economic incentive instruments.
- **Management of Externalities:** Environmental regulations are primarily designed to address negative externalities, such as pollution. The paper highlights that innovation is also a positive spillover that can contribute to broader societal benefits.

Reforms to the resource management system: an analysis of potential impacts for Māori, the housing market and the natural environment (Denne, Torshizian, et al., 2021)

The report points out that the proposed Natural and Built Environments Act (NBA), Spatial Planning Act (SPA), and Climate Adaptation Act (CAA) were expected to incentivise competition and improve the allocation of land and development resources. The overall impact of these reforms was projected to deliver a net benefit of $232 million annually to users of the RM system.

- **Scale and nature of benefits**: The report indicates that limited competition in the land market drives rising house prices. In this context, increased competition and efficiency in the housing market can create consumer surplus for NZ households.
- **Features of a system associated with these benefits:** Streamline regulatory processes, lower compliance costs, standardised zoning rules, and greater Māori participation.
- **Management of externalities**: The reforms proposed maintaining environmental limits and Māori cultural safeguards, reducing the environmental harm of development.

Rethinking the planning system for the 21st century (Airey & Doughty, 2020)

This wide-ranging paper assesses the economic impacts of the current approach to planning in the United Kingdom and proposed a range of reforms.

- **Scale and nature of benefits:** The report argues that the effect of planning restrictions has been to reduce local competition, which reduces incentives for productivity improvements and diffusion of best practice. This stifles innovation and discourages smaller developers who struggle to take on the significant upfront cost necessary to navigate the application process. The authors conclude that these impacts are so significant that a reformed planning system could unleash growth and innovation in the economy more than any other supply-side structural reform.
- **Features of a system associated with these benefits:** A less restrictive approach to commercial and residential development.

Findings

There are a number of areas where the evidence to points to the potential for effective resource management to have a meaningful positive effect on market competition, and thus the economic outcomes associated with it. These include:

- **Lower land prices and housing costs through competition in residential property:** The benefits of increased competition through effective resource management are perhaps most clear with respect to the housing price benefits that can be enjoyed through more competitive housing and land markets, as discussed in section A.
- **Consumer benefits through competition in commercial development:** Also apparent are the benefits that can be achieved by providing for competitive neutrality for commercial developers with the planning system. This has been best demonstrated domestically and overseas with respect to supermarkets where scale, potentially highly competitive markets, and relative homogeneity makes them both at high risk of anti-competitive behaviour and amenable to study. Here it is clear that there is potential for increased production, innovation, and improved consumer surplus through the greater competition that effective resource management can provide for.

While it is likely that such effects exist and apply comparably to other commercial developments, this is less well-studied. Moreover, while the general potential for benefit in supermarkets and commercial development more generally is clear, the scale of this potential benefit, and for what sectors it is largest, is poorly studied and much less well understood than for housing.

- **Enabling entry through fit-for-purpose compliance costs:** A number of studies point to the potential for high compliance costs across parts of the resource management system to restrict entry of new firm, suggesting that where appropriate, lower compliance costs would enable entry. While likely to be directionally correct, there does not appear to be much exploration of the materiality of this effect or where it is most concentrated.
- **Competition in resource allocation:** There is recognition that current approaches to resource allocation are not consistent with maximising competition, as discussed in Section C, and hence there are potential benefits from a more effective approach.

Notably, the literature with respect to use of primary production land focuses little on the potential for competitive benefits through approaches to resource management. This is perhaps unsurprising given such production largely operates directly or indirectly in a globally competitive landscape with local competition loss due to land use restrictions immaterial.

The evidence points to the following features of an effective resource management associated with competition-related economic benefits:

- a generally enabling approach to residential planning, as discussed in Section A
- an inability to utilise the competitive pressures or negative impacts on existing businesses as a basis to restrict commercial development or raise barriers to entry through the resource management system
- competitive access to natural resources to improve project viability and competition
- consideration of impacts to firm entry when assessing the economic impacts of compliance costs.

Notable areas of evidence gaps not discussed elsewhere in this report include:

- exploration of the impacts on competition from resource management approaches to commercial development outside of the grocery sector
- assessment of the extent to which compliance costs are a material barrier to entry and for which sectors this is most likely to be the case.

G. High quality and accessible information

Introduction

High quality and accessible information underpins many of the other benefits discussed in this report. Intrinsic to resource management is choices around trade-offs. In many cases, these trade-off balance

market economic benefits (that are the focus of this report) against non-market benefits. These trade-offs occur at levels of primary legislation, national direction, standards development, urban plans, individual consent choices, and judicial and quasi-judicial processes. In all cases, better quality information, should, in principle, be associated with higher quality decisions, maximising economic outcomes where consistent with other considerations.

It is also reasonable to expect that information that supports improved resource management decision-making (for example, information about the built and natural environments) will have broad application outside of resource management, including to those engaging in market economic activity.

In contrast to the other benefit areas, solutions here are more likely to be found in investment and management solutions that enhance the quality of the regulatory system, rather than in design features of the system itself.

Relatively few studies focus directly on questions of the value of information in resource management or clearly related areas. However, the role of data, and in particular, observations of insufficient data and recommendations for investment are a very common feature of the literature. As a result, most relevant studies for this section are presented in earlier sections.

Evidence review

Singapore's Smart Nation 2.0 Initiative (MDDI, 2024)

The report outlines Singapore's strategic vision to advance society through digital technologies. While the primary focus is on fostering a digital economy, resource management plays a key role in ensuring sustainable growth and resilience. A central part of the strategy is the **Green Data Centre Roadmap**, which aims to improve energy efficiency and integrate renewable energy into data centre operations, enabling sustainable capacity expansion while reducing environmental impact.

- **Scale and nature of benefits:** The strategy aims to position Singapore as a digital infrastructure hub, driving economic growth by attracting global tech firms and skilled labour.
- **Features of a system associated with these benefits:** Data is both the foundation and the result of this strategy. However, ensuring sufficient land and energy supply for data centres is crucial for the strategy's success.[77] Employing **Smart Urban Planning** tools, which enable scenario-based land use planning with data and AI, the planning process is expected to deliver sustainable, secure, and efficient infrastructure.
- **Management of externalities:** To manage negative externalities, such as increased pressure on housing and green spaces from data centre growth, Singapore integrates digital infrastructure considerations into the Urban Redevelopment Authority (URA) **Master Plan**.

[77] How Singapore Uses Data To Deliver Its National Vision For Infrastructure | Institution of Civil Engineers (ICE)

High level valuation of New Zealand's environmental data architecture – (Allen + Clark, 2025, unpublished draft)

This project evaluated the economic value and growth potential that could be realised within the RM system through enhanced data and technology. It employed international case studies.

- **Scale and nature of benefits:** The 30-year present value of improved environmental information systems could range between $1.3 billion and $1.9 billion. This includes economic efficiency gains and avoided societal costs from environmental degradation, lost ecosystem services, and pollution-related harm.
- **Features of a system associated with these benefits:** There are significant benefits to be gained from initiatives that enhance data centralisation and digital tools, such as:
  - centralised platforms, such as South Australia's PlanSA, can support more agile planning processes
  - authoritative baseline data, such as the Bureau of Meteorology's water information, can be valuable as New Zealand explores water trading to improve allocation efficiency
  - earth observation technologies, like Digital Earth Australia, can enhance New Zealand's land-use planning, water management, hazard response, and agricultural productivity.

Unlocking the Value of Data: Managing New Zealand's Interconnected Infrastructure (The Infrastructure New Zealand Digital Twin Working Group, 2020)

This research outlines the benefits for NZ in developing a National Digital Infrastructure Model (NDIM) and provides national and international examples.

- **Scale and nature of benefits:** Central government and local governments together bear the responsibility for approximately $216 to $350 billion worth of infrastructure assets. Common data standards facilitate the integration of data in ways that can result in several benefits. Specifically, it enables the development of digital twins, which are virtual representations of real systems, allowing for the analysis, simulation, and management of the physical systems. An NDIM would function as a key component in a National Digital Twin, offering numerous benefits related to infrastructure, such as informing investment strategies for new assets, measuring and comparing performance, assessing risks associated with deterioration and failure, and enhancing resilience. Additionally, NDIM can provide a range of non-financial benefits to the community. The value of these benefits are not estimated.

Focusing Aotearoa New Zealand's environmental reporting system (Parliamentary Commissioner for the Environment, 2019)

This report provides recommendations for improving NZ's environmental reporting system.

- **Scale and nature of benefits:** This report argues that NZ's broader environmental data and knowledge system is largely fragmented, with numerous providers collecting environmental information for various purposes. It stresses that an inactive approach to environmental reporting has resulted in tangible costs, which extend beyond the environmental factors and have significant implications for the economy and society. An example of this are the social and economic costs resulting from the campylobacteriosis outbreak, with estimated at around $21 million - excluding loss of life.
- **Features of a system associated with these benefits:** The primary focus of recommendations in the report is particular amendments to the Environmental Reporting Act as well as related detailed non-legislative process changes. However, it also emphasises the importance of developing an investment case that covers:
  - a comprehensive, nationally coordinated environmental monitoring system
  - a standardised and consistent approach to collecting, managing and analysing data
  - a nationally mandated strategy to ensure that known environmental data gaps are progressively filled
  - the development and maintenance of a fit-for-purpose national online reporting platform.

Environmental reporting, research and investment: Do we know if we're making a difference? (Parliamentary Commissioner for the Environment, 2022)

This report concludes a 5-year period of work. It consolidates key elements required to understand NZ's current environmental data trajectory.

- **Scale and nature of benefits:** Significant public funds are allocated to environmental protection. For instance, the central government's direct environmental protection expenditure totalled $2.6 billion for the year ending 30 June 2020, while revenue from environmental taxes amounted to $5.8 billion. This report argues that there is potential for enhancing accountability through the use of reliable data and mātauranga Māori. This could involve improving data on the amount and distribution of environmental expenditure, as well as understanding the impact of such spending, in order to address environmental liability and future fiscal risks, and to gain insight into current baseline spending and the effectiveness of future expenditures.
- **Features of a system associated with these benefits:** The report suggests the need for:
  - Clear communication on the environmental outcomes set by governments
  - a more detailed explanation of their plans and strategies to achieve these outcomes
  - clarity regarding the allocation of funds for delivering these priorities
  - more information about the impact of the spending and the progress being made

- comprehensive reporting to parliamentarians and citizens, ensuring transparency in government actions and decisions.

Submission on Natural and Build Environment Bill and Spatial Planning Bill (New Zealand Planning Institute, 2023)

The NZ Planning Institute submitted this document to endorse the NBE and SP Bill under the previous Government, and to offer recommendations for better releasing their potential.

- **Scale and nature of benefits:** The submission highlights many benefits that they expected could be achieved by implementing and enhancing the bill. One key improvement they identify is the significant missed opportunity in the reforms related to the potential of the RM system to offer a modern system supported by digital technologies. They argue that this is crucial for the reform to successfully achieve its objectives in an efficient and effective way.
- **Feature of system:** Their recommendations regarding data quality and information involve: requiring a strong, nationally standardised data collection and sharing system; promoting the use of modern digital systems and tools in managing the system; and offering enhanced access to environmental information and data in user-friendly formats.

Unlocking the Benefits of Environmental Data for RM Reform (Allen + Clark, 2025, working draft)

This report presents a high-level valuation of NZ's environmental data system and outlines a strategic investment approach to support the RM reforms.

- **Scale and nature of benefits:** The report concludes that sustained investment in enhanced environmental data is essential for safeguarding the anticipated economic gains from the RM reforms. Enhanced environmental data will bolster economic growth and the overall functioning of the economy by enabling people to confidently operate within environmental constraints, while also unlocking development opportunities and mitigating the risks of irreversible degradation that could lead to significant economic damage.

  The report indicates that improved environmental data systems could generate benefits ranging from $1.3 billion to $1.9 billion over 30 years. It also identified $407 million in additional national income by 2035 through increasing efficiency investment resulting from reduced need for professional services and shifting that investment to IT services. The modelling of the strategic investment approaches, which combines a range of data packages at different implementation levels, suggest that even at the highest investment level, a benefit-cost ratio of approximately 4 is expected.
- **Features of a system associated with these benefits**: MfE identified six data-related packages of investment to support the RM reforms that were considered by the reports authors. The packages cover the integration of spatial data sets, the establishment of an E-consent portal, a system performance focused on the core targets of the new RM legislation, compliance monitoring, and

targets related to the natural and built environment. It also discusses ongoing, targeted investment in data and the development of data twins to better inform decision-making. As a whole, the report highlights that, to ensure that the RM reforms deliver the expected economic benefits, it is important to treat environmental data as national infrastructure.

Joining the dots: information systems for better resource and infrastructure management (Simpson, 2023)

This white paper outlines the potential of a digital transformation based on a digital earth framework to effectively achieve the goals of the Infrastructure Commissions 30-year Infrastructure Strategy.

- **Scale and nature of benefits:** The report highlights that transitioning to a digital continuum to represent the built and natural environments offers substantial economic benefits, including increased efficiency, risk reduction, informed infrastructure development, and improved engagement with the community and Mana Whenua.
- **Features of a system associated with these benefits:** The paper presents a range of recommendations to implement a digitally integrated ecosystem in NZ's RM processes. Specifically, it calls for reforming the RMA by introducing digitally enabled processes through a federated framework, aiming to improve decision-making and encourage greater effectiveness. At a more pragmatic level, this could entail, for example, enabling data through an open platform for consent processing, as well as other applications.

Findings

The evidence points to the potential economic benefits of more high quality and accessible information within the resource management system in two ways:

- **Identification of scale of relevant economic activity to be enhanced:** A range of studies focused, in particular, on the value of the natural capital or ecosystem services. They highlight the large scale of economic value, while pointing to limitations in understanding as a result of data availability. While they do not generally identify the mechanisms by which improved outcomes with respect to these assets would occur, it is suggestive of the scale of potential benefit that could be achieved through better decision making enabled from investment in data availability and accessibility.
- **Some attempted quantification of the potential value:** Only one domestic study (currently underway) seeks to meaningfully quantify the scale of potential benefits, which were determined to be substantial (potentially in excess of $2 billion in present value terms). These include but are not limited to market economic benefits (the estimate approach doesn't meaningfully distinguish between market and non-market benefits).

As discussed in the introduction to this section, the potential system response here is largely one of investment, with the key question being around scale and focus of any such investment. The studies point towards substantial levels of investment as potentially being justified. The evidence reviewed is

not sufficient to indicate any particular scale or focus of investment as being optimal. We note that one study (Allen and Clarke, 2025) does seek to do this, making the case that investments in the hundreds of millions in present value terms is likely to be justified by the evidence, but this is a single study.

That notwithstanding, the evidence is strongly suggestive of an increased level of investment and focus on data to support effective and efficient resource management, and its potential to contribute to a range of outcomes including in the market economy. In particular, several of the features of resource management that this report suggests would contribute to economic benefits are likely to be highly reliant on higher quality and more timely information.

Beyond making the case for investment in data systems general, and in some cases specific areas, key themes we identified were:

- The criticality of investment in, and regulation to support, common data standards and reporting requirements
- The need for improved data and monitoring for any resource management system reliant more on monitoring and enforcement than upfront consenting as well as implementation of 'environmental bottom lines' or similar approaches

Additionally, we note that most of the sources reviewed that focused substantially on data (most of which call for additional investment in resource management data) do so largely from an environmental perspective.[78] It appears that there has been comparatively little focus on the importance of evidence systems for understanding the market economic impacts of resource management or related environmental regulation, despite the substantial role these systems have in influencing these outcomes. Inal Areas where the evidence base could be strengthened include:

- assessment of the impact of previous investments in environmental and other resource management data on the quality of decision making of subsequent economic outcomes
- more granular studies on data requirements with respect to sectors, and in what ways this could inform improved decision making, and the value of this improvement.

[78] Allan and Clarke (2025) is a notable exception to this.

Conclusions

This report sought to explore, through review of existing evidence, three related questions

- What is the nature and scale of potential economic benefits that can be achieved through more effective resource management?
- What are the features of a resource management system associated with achieving those benefits?
- Where are the gaps in the evidence base that make it difficult to answer the questions above?

This conclusion section is organised around these three questions.

Nature and scale of potential benefits

Overall, the evidence base supports the view that more effective resource management has the potential to provide large-scale economic benefits across broad areas of market activity. Given the scope of the resource management systems' interaction with investment, operations, and resource extraction, this is perhaps unsurprising.

Across all the benefit areas explored, a balance of judgement suggests that the potential for economic benefits is large and diverse. However, the extent to which this can be fully understood varies widely across the benefit areas this report considered. A brief summary of the understanding across each benefit area is provided below:

- **Growing and well-functioning urban areas:** This represents the area of most clearly demonstrated potential benefit. It is grounded in research of the impacts of historic differences in approaches to resource management, as well as detailed modelling of the impacts of various potential changes. Domestic and international literature on the relationship between housing and urban development outcomes, and wider economic outcomes broaden understanding. The economic benefits of enablement of intensification are large and well-established. Greenfields enablement has clear benefits with respect to housing supply and affordability, particularly through land price depression. The optimal balancing of greenfield development with the greater cost of infrastructure it may impose is less well-established.
- **Effective and affordable provision of infrastructure:** The research points to the range of ways in which the resource management system impacts the provision of infrastructure, including influence of urban form, access to natural resource inputs, direct consenting costs, application of standards, and ability to secure land. In many cases, these are well quantified and point to benefits through reduced costs, greater productivity of assets, or reduced investment requirements.
- **Productive use of natural resources and natural capital growth:** Although approaches and estimates vary, there is a well-established evidence base on the value of natural capital and

ecosystem services, which is suggestive of the potential benefits here. However, understanding of how the value is affected by the effectiveness of resource management appears limited.

Relatedly, while there is moderate understanding of the compliance costs and opportunity costs associated with particular sectors, the research does not typically consider the impacts on natural capital to determine the net economic impact.

- **Efficient regulatory administration:** There is a good evidence base on the scale of regulatory administration costs and some attempts to quantify how much of this could be reduced under alternative compliance arrangements. These potential benefits largely emerge though the reduction in the number of activities required. The scale of these costs are material at an economy wide level. In general, however, these studies generally do not engage with the effectiveness consequences of reduced administrative burden, if any.
- **Resilience to natural hazards:** The historical and potential future economic consequences of natural hazards, through risk to natural and physical capital in particular, is reasonably well understood and substantial. This is clearly suggestive of the potential benefits from more effective approaches to natural hazard risk mitigation through resource management including through efficient restriction of development in high-risk areas and information provision. However, despite the central role the resource management system plays in mitigating the risk of natural hazards, the relationship between different approaches and natural hazard outcomes appears very minimally studied in New Zealand and it is difficult to infer from the evidence base a realistic scale of potential benefits here.
- **Competitive markets:** Much of the evidence points directionally to benefits that additional competition could provide for, with the primary focus being on residential property, commercial property and services (primarily grocery), and resource use. Outside of housing, the scale of the benefits is less well established, but in contrast to many other areas of potential economic benefits, appears less likely to be offset by additional negative externalities. The lack of domestic evidence on the scale of benefits from more competitive approaches to resource use is notable.
- **High quality and accessible information:** A very wide range of studies point to the need for additional information, although this is only infrequently tied to an assessment of the particular improvements that could be made to resource management effectiveness or the value of this improvement in performance. While only one source specifically engages with what is likely to be an appropriate level of investment, a common theme across many sources is that New Zealand should increase investment and prioritise improving associated regulation.

Feature of systems associated with economic benefits

Evidence gaps (discussed below) limit the extent to which clear and granular conclusions about which resource management approaches are most effective in achieving economic benefits. The relative lack of research that engages with the trade-offs inherent in this system presents a particular challenge. Nevertheless, a number of findings emerge cutting across the benefit areas.

- **Market-based approaches:** At the highest level, a key theme running through many of the features associated with improved economic benefit is a reliance on more market-based approaches for resource allocation and use, whether this is urban or non-urban land or natural resources. Most of the potential economic benefits emerge from an RM system that enables markets to direct resources to their highest and best use, provided that material externalities are managed, and appropriate environmental protection occurs.
- **Enabling urban planning as a starting point:** While trade-offs exist everywhere in resource management with respect to providing more enabling approaches, the balance of that trade-off appears clearest in urban planning. Here, the evidence base strongly points to substantial economic benefits associated with enabling approaches to residential and commercial development. These are likely much larger than any negative externalities created.
- **Competition and new-entrant access:** Although competition was defined as a particular benefit area for the report, it emerged as an important lens through which to consider many of the issues raised in the research. This suggests a greater focus on the extent to which resource management settings are supportive or inhibiting of competition, including through assessing the impact of compliance requirements on new entrants. An important aspect of this is national consistency in requirements wherever possible.
- **Decisions grounded in an understanding of value of natural capital and ecosystem benefits:** Critical to supporting informed trade-off choices, even from a primarily market-economic perspective, requires improved understanding of natural capital and ecosystem benefits, and critically, an evidence-based understanding of the impacts to those values from environmental change. This will need to be underpinned by appropriate investment in data systems and monitoring.
- **Planning underpinned by a long-term view of the infrastructure implications:** A system that provides for a long-term view of infrastructure implications from development choices, though spatial planning and related exercises, will be necessary to realise many of the benefits identified in this report and for resolving areas of challenging trade-off. The use of such planning to secure key land and corridors for future infrastructure development is also important.

In general, higher thresholds for requiring consent, greater use of permitted activities, and development-by-right are clearly associated with achievement of first-order economic benefits through reduced costs, additional productive activity, and increased direct social surplus. However, the evidence reviewed does not provide sufficient granularity to determine where this represents an optimal approach.

Evidence gaps

Specific areas of evidence gaps associated with particular benefit areas are presented in individual findings sections. Across these, we identified a number of common findings around limitations to the current evidence base that may inform future investment and focus:

- **Urban versus non-urban:** Overall, the evidence base is much stronger around potential economic benefits in urban environments versus non-urban environments. The scale of potential economic benefits, the influence of resource management on them, and the system features associated with achieving those benefits is generally better understood in urban settings.
- **Understanding of actual outcomes is limited:** Study of the actual impacts on economic outcomes of different current or past approaches to resource management is limited. It is best studied with respect to urban planning and infrastructure and to direct administrative and compliance costs. Study of real-world impacts in areas such as natural hazard resilience, resource allocation, impact on natural capital or use of data, driven by specific resource management settings is limited.
- **Research is largely uni-directional:** Despite resource management being fundamentally about trade-offs, the research overwhelmingly focuses one direction of potential benefit or cost. Studies around compliance costs rarely also consider the benefits of those requirements. Studies on the value of natural capital and ecosystem service generally do contend with alternative uses. Some cost-benefit analysis do seek to address this, but with limitations. Improved understanding of the true economic consequences of differing approaches to resource management will require, in part, more holistic approaches to research in this space.

  Natural hazard resilience stands out as a gap: Within these general gaps, the relative absence of research on the extent and means by which resource management can efficiently protect against natural hazards and natural disasters to maintain natural capital, ecosystem services, and minimise economic disruption, while not unduly restricting development, stands out as a particular potential area of focus. It may be that we were unable to fully uncover the evidence that does exist, but the lack of relevant sources identified by MfE officials or referenced in relevant literature reviews suggests the gap is real.
- **The gaps are large, particularly given the stakes:** The balance of evidence clearly points to extremely large potential for economic benefits from more effective resource management. This is consistent with the fundamental role the system plays in constraining, enabling, and directing economic activity and protecting natural and physical capital. The disconnect between the scale of the potential benefit, and the limited empirical understanding of the implications of different resource management approaches to economic outcomes is striking.

  Determining the reasons that this is the case is outside the scope of this report. However, it likely relates to factors such as investment in information systems (including standardised data architecture), availability of research funding focused on practical questions of resource management policy and practice, and willingness to scrutinise the impacts of status quo approaches or test the impacts of change. It may be that the current reform process offers an

opportunity to move to a system better equipped to iterative learning. Doing so will in the long-run likely be important to realising the market economic benefits identified in this report in an efficient way over time.

Appendix 1 – Summary of benefits

Growing and well-functioning urban environments section

Source	Benefit
The welfare effects of character protections on neighbourhoods (Greenaway-McGrevy & Jones, 2025)	• Welfare benefits
Empty homes, longer commutes: the unintended consequences of more restrictive local planning (Cheshire et al., 2018)	• Housing market efficiency
Evaluating the long-run effects of zoning reform on urban development (Greenaway-McGrevy, 2023)	• Improvements in housing shortages • Improvements in affordability issues
Restrictive land use regulations and economic performance (Osman, 2020)	• Better mobility, land allocation and productivity gains
Impacts of planning rules, regulations, uncertainty and delay on residential property development (Grimes & Mitchell, 2015)	• Increased development investment • Increased housing supply
Links between planning and economic performance: Evidence note for LSE Growth Commission (Cheshire et al., 2012)	• Increased development investment • Retail productivity benefits
The planning premium: the value of well-made places (Savours, 2024)	• Productivity benefits
The economic implications of housing supply (Glaeser & Gyourko, 2018)	• Homeowners' gains • Improvements in housing shortages • Improvements in affordability issues
Cities with forking paths? Agglomeration economies in New Zealand 1976–2018 (Donovan et al, 2022)	• Agglomeration economies
Cost-Benefit Analysis of proposed medium density residential standards (PWC & Sense Partners, 2021)	• Improvements in housing shortages • Improvements in affordability issues
Can zoning reform change urban development patterns? Evidence from Auckland (Greenaway-McGrevy & Jones, 2025)	• Improvements in housing shortages

Land-use, transport and population health: estimating the health benefits of compact cities (Stevenson et.al., 2016)	• Reduced healthcare costs, improved productivity, and enhanced quality of life
Impact of urban form on transport and economic outcomes (Donovan & Munro, 2013)	• Labour productivity benefits
The value of urban design: the economic, environmental and social benefits of urban design (MfE, 2005)	• Property values' boost • Attraction of businesses • Economic stability
Urban land prices, a progress report (Infrastructure Commission, 2023)	• Improvements in affordability issues
Land use planning: the damaging impact on retail productivity (Cheshire et al., 2011)	• Retail productivity benefits
Costs and benefits of alternative growth scenarios for Sydney (Rajaratnam & Manners, 2012)	• Efficient urban development
The value of land, floorspace and amenities: hedonic analysis and cost benefit analysis of planning regulations (Nunns & Balderston, 2015)	• Improvements in affordability issues
Understanding the costs and benefits of planning regulations: a guide for the perplexed (Nunns & Rohani, 2016)	• Agglomeration economies • Efficient urban development
Findings on developers' engagement (Ministry of Housing and Urban Development, 2025, unpublished)	• Increased development investment • RM system efficiency
A New Approach to Urban Planning (Blaschke et al., 2021)	• Improvements in housing shortages. • Improvements in affordability issues
Better Urban Planning (The New Zealand Productivity Commission, 2017)	• RM system efficiency • Improvements in housing shortages. • Improvements in affordability issues
Using land for housing (The New Zealand Productivity Commission, 2015)	• Improvements in housing shortages • Improvements in affordability issues.
Benefits from Auckland road decongestion (Destremau et al., 2017)	• Labour productivity benefits • New jobs
Analysis of availability of land supply in Auckland (Ngo & Parker, 2024)	• Improvements in affordability issues

Assessment of the Housing System: with insights from the Hamilton-Waikato Area (The Treasury New Zealand, 2022)	• Improvements in affordability issues. • Improvements in housing shortages.
What Drives Rents in New Zealand? National and Regional Analysis (Bentley et al., 2023)	• Improvements in affordability issues

Effective and affordable provision of infrastructure section

Source	Benefit
Protecting land for infrastructure - How to make good decisions when we aren't certain about the future (New Zealand Infrastructure Commission, 2023)	• Reduced land costs for infrastructure construction
Infrastructure consenting for climate targets – estimating the ability of New Zealand's consenting system to deliver on climate-critical infrastructure (Moore et al., 2023)	• Lower liability costs
Integrated land use and transport planning (Crossland et al., 2022)	• improved quality of life, including better economic opportunities
Infrastructure resources study (New Zealand Infrastructure Commission, 2021)	• Improved accessibility of construction materials for infrastructure development
The costs and benefits of urban development: a theoretical and empirical synthesis (MRCagney, 2019)	• Enhancing competition in the housing market
National Policy Statement for renewable electricity generation – Regulatory Impact Statement (MfE, 2011)	• Renewable energy generation resilience
Report of the outcome evaluation of the National Policy Statement for renewable electricity generation (MfE & MBIE, 2016)	• Increased development and maintenance of renewable electricity generation initiatives.
The cost of consenting infrastructure projects in New Zealand (Sapere for Te Waihanga, 2021)	• Reduced consenting costs for infrastructure projects
Updating the National Environmental Standards for Telecommunications (NZ Telecommunication Forum, 2024)	• Expansion of the telecommunications network to ensure economic growth and innovation
The Future is electric – a decarbonisation roadmap for New Zealand's electric sector – (BCG, 2022)	• Affordable electricity to foster economic growth and sustainability
Understanding the value of meeting the requirements of environmental legislation for roading improvement projects (Reed et al., 2019)	• Resource optimisation
Futureproofing access to aggregate – economic considerations (McIlrath & Harris, 2024)	• Improved accessibility of construction materials for infrastructure development. • Reduced consenting costs and timeframes for infrastructure projects

Measuring the benefits of the Strategic Planning Act (SGS Economics and Planning, 2021)	• Increased confidence in RM reforms
Great Decisions are Timely: Benefits from more Efficient Infrastructure Investment Decision-Making (Torshizian & Maralani, 2023)	• Reduced costs and timeframes related to the decision-making process for infrastructure projects
Benefits from Auckland road decongestion (Destremau et al., 2017)	• Reduced congestion, which can result in new jobs, higher productivity, time savings for travel, and reduced emissions.

Productive use of natural resources and natural capital growth section

Source	Benefit
Measuring the cost of environmental compliance for Waikato dairy farmers – a survey approach (Macdonald, Rowarth & Scrimgeour, 2015)	• Reduced regulatory uncertainties • Effective implementation of RM policies
Optimising resource management for critical raw materials: a case study of the application of UNRMS with Cornwall Regional Government, UK (Marquis et.al., 2024)	• Sustainable natural resource extraction to support economic growth and maintain existing wealth
Minerals Briefing Paper – Policies for increasing New Zealand's attractiveness for investment in responsible minerals exploration and mining (Straterra, 2014)	• Sustainable natural resource extraction to support economic growth
Cost and trade impacts of environmental regulations: effluent control and the New Zealand dairy sector (Cassells & Meister, 2001)	• Strengthening international competition in the dairy sector
Investing in nature – the economic benefits of protecting our lands and waters (US Fish & Wildlife Service & Lant Trust Alliance, 2021)	• Increased social surplus from the protection of land and water
Regulatory constraints to agricultural productivity (World Bank, 2017)	• Higher agricultural productivity
Essential Freshwater Package: benefits analysis (Denne, 2020)	• Lower health-related costs • Consumer surplus from recreational uses • Stronger exports sector
Regulatory impact analysis action for healthy waterways (MfE, 2020)	• Preserving existing wealth • Ensuring long-term growth
Community forestry in British Columbia, Canada: history, successes, and challenges (Gunter, 2022)	• Economic growth as a result of new jobs and providing direct revenue to local governments and communities.
Water governance in the Netherlands – fit for the future? (OECD, 2014)	• A more efficient and resilient water governance • Effective infrastructure investment • Economic growth and wealth resilience
Cumulative impact of government policy on New Zealand sheep and beef farms (French et al., 2023)	• Higher agricultural productivity

	• Reduced regulatory uncertainties
Nature-based solutions and their socio-economic benefits for Europe's recovery (Kopsieker et al., 2021)	• Jobs protection and creation • Reduced public costs • Resilience and food security
The economic and competitive benefits of environmental policy (Gomola et al., 2024)	• long-term resilience and productivity
The value of public conservation land (NZIER, 2024)	• Maintenance and improvement of environmental and economic resilience
Our land 2024 (MfE & Stats NZ, 2024)	• Economic growth and resilience • Enhanced cost-effeteness
The start of a conversation on the value of New Zealand's natural capital (van Zyl & Au, 2018)	• Protection of natural capital
'Total Economic Value' of New Zealand's land-based ecosystems and their services (Patterson & Cole, 2008)	• Better accountability of intrinsic and long-term ecosystem values
Water management in New Zealand – a roadmap for understanding water value (Kaye-Blake et al., 2014)	• Improved competition, productivity, and social surplus
Can Norway be a role model for natural resource abundant countries? (Cappelen & Mjøset, 2012)	• Wealth resilience • Economic growth and sustainability
Policies for the future of farming and food in the Netherlands (OECD, 2023)	• An efficient, productive, and export-oriented agriculture sector
Learning from 20 years of Payments for Ecosystem Services in Costa Rica (Porras et. al., 2013)	• Creation of new jobs and economic activity • Enhancing resilience to climate change

Efficient regulatory administration section

Source	Benefit
Economic impact analysis of the proposed resource management reforms (Castalia, 2025)	• Reduced administrative and compliance costs
Supplementary Analysis Report: the new resource management system (MfE, 2022)	• Improvements in housing supply • enhanced infrastructure resilience
Understanding the productivity impacts of the resource management system (2021)	• Reduced administrative and compliance costs • Improved allocation of resources

Resilience to natural hazards section

Source	Benefit
Does adaptive management of natural resources enhance resilience to climate change? (Tompkins & Adger, 2004)	• Preserving existing wealth
OECD Economic Surveys: New Zealand (OECD, 2024)	• Sustainable economic growth and resilience
Infrastructure for a climate-resilient future (OECD, 2024)	• Reducing costs through proactive investment in resilient infrastructure
Lifelines – the resilient infrastructure opportunity (Hallagatte et al., 2019)	• Realising economic opportunities and reducing costs through proactive investment in resilient infrastructure
Estimated number and valuation of residential properties within inundation/flood zones impacted by climate change (Storey et al., 2025)	• Reducing costs through proactive flood mitigation planning
How effective are resilience-focused policies? A literature review (Pells, 2024)	• Enhance the ability of the economy to withstand and recover from shocks
Protecting New Zealand from natural hazards (Insurance Council of New Zealand, 2014)	• Reducing costs by reducing New Zealand's vulnerability to natural hazards
Natural hazards-related public spending in New Zealand (White et al., 2025)	• More efficient natural hazards public spending

Competitive markets section

Source	Benefit
Market study into the retail grocery sector (Commerce Commission NZ, 2022)	• Enhanced competition in the supermarket sector
The impacts of environmental regulations on competitiveness (Dechezlepretre & Sato, 2017)	• Economic growth through innovation, attraction of new businesses, job creation and better resources allocation
Regulatory compliance burdens: literature review and synthesis (Cordes et al., 2022)	• Improved market competition by reducing regulatory friction
The innovation and performance effects of well-designed environmental regulation: evidence from Sweden (Weiss & Anisimova, 2018)	• Induced innovation offsets through improved energy efficiency
Reforms to the resource management system: an analysis of potential impacts for Māori, the housing market and the natural environment (Denne, Torshizian, et al., 2021)	• Enhanced competition in the housing market • Better allocation of land and development resources
Rethinking the planning system for the 21st century (Airey & Doughty, 2020)	• Increased innovation and competition among developers
AMM modelling of uncompetitive urban land markets (Parker, 2021)	• Homeowners earning • Enhanced competition in the land and housing market

High quality and accessible information section

Source	Benefit
Singapore's Smart Nation 2.0 Initiative (MDDI, 2024)	• Sustainable growth and resilience by enabling the sustainable capacity expansion of data centres • Improved energy efficiency
Report 1 – High level valuation of New Zealand's environmental data architecture (Allen + Clark, 2025, unpublished draft)	• Economic efficiency gains and avoided societal costs from Improved environmental information systems
Unlocking the Value of Data: Managing New Zealand's Interconnected Infrastructure (The Infrastructure New Zealand Digital Twin Working Group, 2020)	• More efficient infrastructure investment • Risk reduction • Resilience
Focusing Aotearoa New Zealand's environmental reporting system (Parliamentary Commissioner for the Environment, 2019)	• Reduced economic costs resulting from an inactive approach to environmental reporting
Environmental reporting, research and investment: Do we know if we're making a difference? (Parliamentary Commissioner for the Environment, 2022)	• Enhancing the accountability of public funds allocated to environmental protection
Submission on Natural and Build Environment Bill and Spatial Planning Bill (New Zealand Planning Institute, 2023)	• Ensuring the successful achievement of the RM reforms objectives
Unlocking the Benefits of Environmental Data for RM Reform (Allen + Clark, 2025)	• Enabling economic growth and the overall functioning of the economy by allowing people to confidently operate within environmental constraints
Joining the dots: information systems for better resource and infrastructure management (Simpson, 2023)	• Increased efficiency, risk reduction, informed infrastructure development, and improved engagement with the community and Mana Whenua

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