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# Theory vs Reality: Making Environmental Use Rights Work in New Zealand

Kevin Guerin

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# Abstract

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The potential advantages in flexibility and efficiency of environmental use rights (such as permits and quotas) over prescriptive regulatory approaches have been well surveyed, and are being advocated in New Zealand now as a tool for achieving sustainable development. So why have they not been more widely adopted here? How can government help remove barriers and improve both economic and environmental outcomes in New Zealand?

At the structural level the barriers tend to be well known, or presumed, as a lack of statutory frameworks or central government guidance, and information costs involved in defining the resource and in determining an appropriate rights framework to optimise its use.

Even given these structural and technical barriers there remains the task of explaining why, since those barriers are not insuperable, little progress has occurred. Other factors include the extent to which such responsibility in New Zealand is delegated by central government, competing priorities for regional governments, lack of pressure on resources (eg; water in much of New Zealand), the difficulty of making contentious choices and strength of existing interests, reluctance to acknowledge any private rights to some resources, the relative ease of using existing regulatory tools, and low benefits relative to costs in small markets particularly where geographical distinctions exist such as for water and certain types of pollution.

This suggests that the best focus for central government may be on better guidance, filling gaps in legislative frameworks, and providing or encouraging provision of the necessary institutions and systems in ways that allow economies of scope and scale. It is unclear how much scope there is for improvement but getting rid of unnecessary barriers, as long as it is done without unnecessary elaboration or restriction, will help secure whatever gains are out there to be had.

## **J E L C L A S S I F I C A T I O N**

D23 - Organizational Behaviour; Transaction Costs; Property Rights,  
H23 - Externalities; Redistributive Effects; Environmental Taxes and  
Subsidies  
K11 - Property Law  
P14 - Property Rights  
Q15 - Land Ownership and Tenure; Land Reform; Land Use;  
Irrigation

## **K E Y W O R D S**

Water, Property Rights, Transferability, Market Based Instruments

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# Theory vs Reality: Making Environmental Use Rights Work in New Zealand

## 1 Introduction

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This paper explores the reasons why use rights approaches have not been applied more widely in the allocation or use of natural resources or the environment generally in New Zealand, and to identify potential solutions for taking them further. Much of the detail and underlying literature is assumed from a previous paper (Guerin 2003b) to simplify this one and allow a tighter focus.

Section 2 outlines how use rights have evolved and discusses some of the key theoretical considerations behind them. It examines reasons why governments or communities might choose to establish an environmental rights regime for the use of a natural resource.

That resource may be a depletable commodity such as coal, a flow such as water, or absorptive or assimilative capacity, such as the ability of water or land to accept and degrade pollution from human activities. The paper then discusses issues for government in managing such regimes, including the need for regulatory regimes and supporting information systems, conflicts between public policy and private business objectives, and the potential for costly litigation and incentives for corruption.

This discussion is set in a particularly New Zealand context. The resources are not unique, but New Zealand has gone to an unusual degree in delegating most environmental management decisions (including policies on air, water and coastal space) to local government. These bodies have been given relatively little guidance, the resources they manage are often individually quite small and the central government has retained limited powers to set central rules.

Fisheries and minerals are managed centrally with settled regimes in place. For other resources the focus is therefore on design principles and guidelines for how existing arrangements can be improved to provide more support to, and fill gaps at, the local level. This could involve legislative action, funding, information or service provision.

Section 3 reviews the requirements for achieving optimal outcomes from a use rights regime in practice, examining issues such as determining and obtaining the necessary information, specifying the rights or the process by which they will later be specified, valuation principles, registration and trading systems, and transition arrangements.

Section 4 examines the necessary legal and institutional structures. Concluding remarks are in Section 5

## 2 Use rights

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Use rights for the purposes of this paper are rights granted or created by government to use a natural resource. The resource in question may be a fixed quantity such as land (setting aside land quality issues), a depletable commodity such as minerals, a flow such as water, or an absorptive capacity such as the ability of water or land to accept pollution discharges. Coverage is limited to those resources for which government has (by ownership or statute) the rights to manage use or occupation.<sup>1</sup>

Environmental use rights can therefore include taking from or discharging to air or freshwater, occupying land or marine space, or offsetting such actions against each other (e.g. where an action with positive externalities is taken at one place to allow another action with negative externalities somewhere else). The rights may be transferable or not.

**Table 1 – Types of Use Rights**

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Water take permits
Water or air discharge permits
Extraction or collection rights for wildlife, timber or minerals
Access or transit rights
Occupation rights

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Use rights provide one means of identifying and prioritising or trading off alternative uses of rights which are under government control. The objective is taken to be the highest value use (or combination of uses) for society, and within each use subsequent allocation to the highest value user (for society).

Societal priorities may vary widely covering any or all of environmental, social, cultural or economic growth (agricultural, industrial, tourism) outcomes. Social priorities can also be built into use rights regimes through such measures as prior rights (eg, minimum environmental flows in rivers) or competitive rights (the ability of interest groups to purchase rights for non-use of resources).

Such use rights (see Table 1 for examples) have common requirements in terms of the information and systems required to support their introduction which allow for them to be discussed together and may provide some scope for economies of scope and scale in their design, implementation and operation. Exploring that scope is the major purpose of this paper.

The other reasons for restricting the scope of this paper is that there is already extensive material available in the general literature on other flexible regulatory approaches such as taxes, subsidies, performance-based standards, education, or moral suasion. Prescriptive regulation is also well understood (see Table 2 for examples of both prescriptive regulation). For some useful starting references on both see (Guerin 2003a) and (Guerin 2003b).

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<sup>1</sup> Issues of underlying ownership rights of the Maori people under the Treaty of Waitangi or through aboriginal title are not strictly part of this discussion, but are assumed to be addressed through settlement mechanisms which are then taken into account in management regimes with allowance for existing use rights.

**Table 2 – Types of Environmental Regulation**

Non-prescriptive	Economic	taxes, charges or subsidies <b>use rights to a resource</b> transferable permits or credits offsets
	Performance-based Voluntary	Standards Education moral suasion
Prescriptive	Regulatory Instruments	Process or Equipment specification Input, Output, or Discharge quantity limits. Disclosure requirements and audits. Administrative process specification.

Source: Guerin, 2003

## 2.1 Types of Use Rights

Existing rights to resources have evolved through a mix of common and statutory law to reflect circumstances in individual countries and regions. For New Zealand examples and more general literature on property rights see (Guerin 2003b). Variations can include rights being attached to land or not, being allocated to government or private parties, and being constrained within “reasonable” limits or linked to environmental constraints or absolute.

For freshwater for example the two most common bases for rights are riparian where landowners have rights to draw on adjacent watercourses for reasonable needs, and appropriative where rights are established on the basis of existing use. The former was an English precedent established over a long period in a densely settled society, while the latter emerged in the western United States where water was a key element in the early economic development of the settler economy around mining and grazing. New Zealand generally operates a system which takes an environmental baseline and allocates only temporary rights above that, reflecting perhaps a reluctance to acknowledge private rights to such an essential resource.

Specific use rights regimes can be desirable where the existing specification and allocation of rights to a resource is inadequate to achieve optimal outcomes for society. This can often arise in situations where negative externalities exist (such as for emissions where permits can cap the quantity of pollution as opposed to taxes which put a floor under the price of polluting) or where there is pressure on open access resources (e.g. fisheries) or resources traditionally used in common (such as land, eg; the foreshore). Establishing secure long-term property rights can provide incentives for efficient management. Such rights only arise spontaneously where transactions costs and social impacts are low.

The reasons for choosing use rights over other means of managing externalities of use focus around improving management incentives. Where there is a limited quantity of a resource, awarding clear long-term rights to a single party provides appropriate incentives to maximise net benefits from use over time, thereby avoiding dissipation of the resource through competition for short-term economic rents.

Such regimes have been criticised as privatisation of the environment but in many circumstances private owners of use rights, acting within legal constraints, can achieve socially desirable outcomes at less cost than statutory regulation or public provision of



services. Recognising the costs of resource use explicitly also encourages conservation, while affordability concerns (eg. for domestic water supplies) can be addressed through direct measures such as income support policies or targeted subsidies.

## 2.2 Issues for government

Whether a use rights regime (for resources or anything else) requires government (executive or legislative) involvement to establish or operate depends on the extent to which it fits within existing regulatory structures and governmental boundaries, its impact on non-rights holders and how it affects other government objectives. Contract-based regimes may be able to be set up and operate within generic legislation resorting only to the judicial system where necessary.

Where government involvement is required to validate a regime or deal with conflicts with existing structures that involvement will tend to focus around providing the rules structure within which conflicts between the interested parties can be resolved. This is a standard role of government in any society. Typical rules cover decision processes, environmental requirements, information gathering and availability, registry processes and trading rules, arrangements for funding the cost of supporting the regime and dispute resolution.

Whether the government itself provides any or all of those functions will depend on factors such as the potential for conflicts of interest, the need for public assurance that the regime is operating impartially and within public policy constraints, overlaps with existing regulatory structures, and competing objectives for the multiple outcomes that can be affected by use rights regimes.

There are inevitably complications created when the government creates new interactions with business through specifying new rights regimes. To begin with, businesses' existing strategies may be disrupted by the changes, and new strategies cannot be finalised until the new rules are finalised and disseminated, with further delays for implementation.

At the same time, it is difficult for the government to develop such regimes in a robust fashion without a good understanding of how businesses will respond. Ministers and officials also tend not to be well placed to make such judgements, but cannot avoid doing so. They are then faced with the prospect of a degree of close scrutiny and legal review of decisions beyond what would normally be expected, due to the money at stake from those decisions. Risks of corruption also arise. Obtaining the necessary information in advance can be complicated by the lack of existing businesses, or by weak incentives for businesses to engage without some resulting preference to cover their investment, while providing such incentives disadvantages others who did not get that opportunity.

These legal costs and corruption problems can be worse for rights regimes than for other forms of government regulation. The major reason is that the subject of the regulation is explicitly an asset with ongoing income potential, although all regulation affects the distribution of wealth to some degree. The specification and allocation of that asset will inevitably benefit specific individuals and firms, creating obvious incentives.

Issues of local government capacity are particularly significant in the New Zealand context with most environmental decisions delegated to that level. The recent reforms to the local Government Act to facilitate joint planning and operations should help. Issues remain, however, about how to ensure such mechanisms are used when needed, how much central guidance and support is needed or can be provided without compromising local

accountability, and the degree to which central government needs to be able to constrain or direct decisions at the local level.

### 3 Pre-requisites for optimising use rights

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This section discusses key barriers to successful establishment and operation of environmental use rights regimes (see Table 3 for examples).

This involves the classic difficulty of transferring theory to practice, which requires dealing with the imperfections of the real world, “But despite the fact that economists are increasingly called upon to design markets, there is little or no economic literature devoted to the engineering aspects of economic design and the practical problems of moving from theories about simple markets to workable institutions for complex markets” (Roth 1999 :749).

There is a need for a more in-depth understanding of what modifications need to be made in that process to reflect institutional factors, information asymmetries and transaction costs. Theoretical analysis, computational experiments (going beyond theoretical calculations to lab-based experiments involving computer agents or human participants) and real-world pilots can all play roles in achieving that understanding which can allow for revisions to occur at the design stage rather than after implementation, potentially significantly reducing costs.

Experimental economics has been used in Australia as part of a research programme on salt markets which will inform the National Action Plan for Salinity and Water Quality, Market Based Instruments Pilots Program (Duke 2004). The results illustrated expected prices, trading patterns, revenue and impacts. To design and run such experiments requires both resourcing and a good grounding in what the potential real-world problems actually are. The development of the electricity market in New Zealand used such techniques.

#### 3.1 Specific Implementation Barriers

Transaction costs, for initial set-up and ongoing operation, will be highly relevant to practical implementation of use rights as information, enforcement and market administration are not free goods. Operating a use rights system requires supporting infrastructure with “detailed design and credible institutions which cannot be achieved overnight” (Guerin 2003b :14). It is easy to underestimate the requirements for supporting a robust legally enforceable system where the required standards of information are significantly above those required for customary management within a community.

There are a number of factors needed for a transferable permit regime to work (Kearney and Sinner 1997). They include demand exceeding supply, sufficient knowledge of availability and effects of use for central government or councils to set constraints and permit holders to understand their impact, an ability to monitor and enforce permits, benefits exceeding costs, and a sufficiently flexible market for transfer (eg; allowing water transfers at all times instead of just during low flow periods). It is also essential to have clear rules for managing risks relating to changes in resource availability and accepted

processes for managing policy changes needed due to technology or market shifts.<sup>2</sup>  
 Table 3 illustrates barriers to water transfer and possible mechanisms to address them

**Table 3 – Barriers to Water Transfer<sup>3</sup>**

Barrier	Mechanism to Address
Water and land considered as one	Allow consent transfers between locations and issue separate consents for taking and using water.
Maximising production	Transfers will occur where benefits exceed foregone investment.
Resistance to change	Pilot projects.
Irrigation infrastructure	Transfers will occur where benefits exceed foregone investment.
Lack of information on where there is additional water	Require resource assessments. Fund research.
Uncertainties in markets, reliability, land use options, land values, ownership of water	Pilot projects. Flexible regulatory approach. .
Objection to paying for water	Information on limited resource. Demonstrated success in improving trade-offs.
Administratively time consuming	Provide standard rules. Encourage joint administration by neighbouring authorities.
Real time compliance monitoring	Build in as consent condition where cost is justified.
Consent issues associated with temporary transfers	Legalise temporary transfers between users and locations.
Difficulty in defining zones within which a transfer can occur	Require zone definition. Fund research.
Lack of a mechanism to register interest in water	Establish registries. Legalise waiting lists for resource access.
Information on reasonable/realistic use	Require strategic resource planning.

Source: Robb, Morgan and Harris (2001)

Size and scale are significant to determining the viability of a rights approach. The resource must be sufficiently large and valuable for the benefits of optimisation to cover the costs of operating the necessary systems. As discussed below water is problematic in this regard because the size of catchments may be too small, and the resource not sufficiently scarce, to justify a transferable use rights regime in parts of New Zealand. Similar issues are likely for air discharge trading schemes and other resources. It is, however, easy to underestimate the potential for new uses and values to emerge once robust rights are defined, and for values to rise over time.

There may be merit in experimenting providing generic rules for defining resources and allowing trading, in parallel with specific schemes targeted at those catchments or airsheds where a viable market is most likely.

### 3.2 Information

All aspects of the creation and operation of use rights depend on information regarding the resource in question. That information can include the quantum and quality of the resource, its location, the environmental impact of its use and methods for tracking who is using it and how (see Table 4).

The cost and difficulty of obtaining this information can vary tremendously. In some cases it will already exist as a spin-off from other activities or there will be a public interest in generating it regardless of what use rights may exist. In other cases those wishing to operate such rights may have to bear the cost of generating the information up front,

<sup>2</sup> It is necessary to have "rights with enough flexibility to evolve ... but to be inflexible enough to have the lasting value needed to provide an incentive to purchase them" (Haddad 1997 p19).

<sup>3</sup> Useful references are <<http://www.maf.govt.nz/mafnet/rural-nz/sustainable-resource-use/water-efficiency/>> and <<http://www.mfe.govt.nz/issues/water/>>.

sometimes along with other information of public value as part of the price for access to the resource. Relevant factors will include whether the private benefit is sufficient to cover the cost of developing the information, or if not, whether any externalities generated by gathering the information merit a degree of public funding.

Information problems become particularly acute when the underlying science is uncertain, in terms of either general principles or the specific ecosystem in question. This tends to increase the required scope of information gathering and the degree of environmental safety margin provided for in the nature of the rights to be created.

**Table 4 – Information needed to support rights**

Marine environment (oceans or coastal marine area)	Type of activity Need for permanent or temporary structures Impacts on other activities Geographic delineation
Freshwater use rights	Location of take or discharge Peak and aggregate flows and variation Change in state of water Groundwater recharge
Environmental offsets	Ability to measure and compare losses and gains ecologically/economically Knowledge of effect of temporal and locational differences
Fishing quota	Fish stock and lifecycle Recreational and customary use Catch data

The Resource Management Act 1991 (RMA) requires local authorities to gather the information needed to carry out their functions. This is often implemented through requiring collection and provision of information by private parties as part of applying for or operating under resource consents (Ford, Butcher, Edmonds and Braggins 2001). Such an approach makes sense where the information creates private benefits, but if taken too far risks discouraging worthwhile investment and creating a free-riding effect for subsequent applicants seeking to undertake subsequent activities. Such risks are particularly significant when dealing with “common” resources such as freshwater and the coastal marine area.

In the fishing industry the costs of research on sustainable fish stocks are met primarily by the industry which captures most of the benefits. This has led to significant industry involvement in research management which in turn has raised fears of bias in the research results. Such tensions are inevitable and how they are managed depends on the balance of risks and incentives as identified by regulators.

For minerals, exploration reports are collected from companies under the Crown Minerals Act (1991) and its predecessors and treated as confidential for 5 years, or less if the licence or permit expires before this and no subsequent permit is granted. After the confidential period anybody can view the material or obtain copies at minimal cost. It may be worth investigating such mechanisms elsewhere, although this might discourage investment (the approach could be reviewed if this was a problem, at a cost of some delay in resource development).

Electronic access to resource, consent and trading data could be investigated to reduce costs for both regulators and users of natural resources.

### 3.3 Specification of rights or process for defining them

Use rights can take many forms. Key characteristics of rights include the extent to which they can be transferred or transformed without requiring third-party approval, the degree of exclusivity they offer over the underlying resource which can range from freehold title to a specified time period or a minimum take to name some examples, duration and right of renewal, whether the right is absolute or proportional, and compensability for any changes to its terms. For details see (Guerin 2003b).

Resource consents under the RMA are specified in terms of the activity that may be performed and the location at which it can occur. The maximum term of consents is 35 years, but can be less, and there is no automatic right of renewal. Most consents are issued for activities on land already controlled by the applicant. Exceptions are for network projects where use of compulsory acquisition powers may be required and for “commons” resources such as the coastal marine area and freshwater.

Specification of water rights is complicated by a number of factors. A major one is the alternative means of use and the fact that not all uses are mutually exclusive. Water can be used in-stream for cultural, environmental, electrical generation, fish farming, recreational or waste absorption purposes.<sup>4</sup> It can also be extracted for consumption including irrigation, after which it may return directly to the stream, be absorbed into products, go to recharge groundwater, evaporate or be discharged to sea. The availability of water also varies by season and by location, though this can be addressed to some degree through storage and transfer facilities (subject to physical and environmental constraints). Interactions between surface and groundwater supplies also require careful management (aquifer management is very complex, particularly where there is a risk of saltwater intrusion).

Water is managed through allocating how much can be abstracted at particular allocations, but the crucial factor is net water use which is highly uncertain because it is not always known how much water is actually abstracted and it is seldom known how much is returned through direct runoff or through recharging of groundwater supplies.<sup>5</sup> This forces highly conservative initial allocations and therefore suboptimal use. Other important variables for water management include level and consistency of flow (minimum levels versus abstraction limits) and the effect of abstraction relative to natural variation, water quality (including temperature and other forms of pollution), and the impact of one user on the residual users. Water use is highly interdependent with many potential externalities.

Fishing quota is now specified in terms of a percentage of the allowable catch in each quota area. This is a modification of the original approach which was based on fixed quantities of fish. That system was changed following the process of buying back quota, at considerable expense, to reflect reductions in expectations of the sustainable catch. This underlines the importance of specifying rights optimally when first defined.

Aquaculture rights are specified in terms of the site within the coastal marine area where that activity can occur and from which other activities can be excluded. Exclusion is often important for aquaculture and is a distinct factor from consents for land-based activities where exclusive title allows prevention of access. The proposed aquaculture reforms

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<sup>4</sup> It is unclear whether water can be allocated for in-stream use under the RMA.

<sup>5</sup> Groundwater recharge also has a different effect depending on whether the water comes from ground or surface water in the first place. Recharge is more even under irrigation as soil moisture is maintained closer to soil water holding capacity so rain is more likely to generate recharge, but the level of irrigation recharge depends on the type of irrigation used

represent both success and failure in the context of the development of use rights in New Zealand.

They are a success in that the defining of specified zones in which aquaculture may occur allows for better trade-offs between alternative uses of the coastal marine environment, and in that the space within such zones is intended to be allocated to the highest value use.

They are a failure, however, in that they demonstrate how the RMA has not been able to manage the nature of use, and who is able to carry out that use, of the “commons” within its generic framework. The limitations for managing the commons of the “first come first served” approach and rights that do not roll over and cannot easily be switched to other uses did not allow for resolution of the emerging problems consequent on the rapidly developing aquaculture industry. Hence the need for a highly disruptive moratorium (freezing applications until a new regime is in place) and lengthy transition period to the new regime.<sup>6</sup>

Mining permits for Crown-owned minerals give exclusive rights for specific minerals in particular areas. For other minerals the surface land owner has full rights.

As the above discussion will have illustrated to some degree, the importance of certain characteristics vary by the nature of the resource being dealt with and sometimes by the nature of the use. For abstraction of water the essential requirements are the volume and location of the take, but other factors can also be crucial. Irrigation needs water at certain times of the year in minimum quantities, which may or may not correspond with the times it is required for hydro-generation or recreational or environmental purposes.

For aquaculture, the essential requirement is exclusive occupation of space, but the type of aquaculture being practiced will affect the type and level of investment required, and therefore the importance of the term of the right and how expiry and renewal are treated. For both irrigation and aquaculture, the ability to constrain other uses that affect water quality will be important. In defining a new regime, getting the key characteristics of the right worked out in advance will be crucial.

### 3.4 Valuation of rights

Valuation data on environmental use rights in New Zealand is limited. In particular, here is a lack of readily available pricing information for resource consents under the RMA (including for aquaculture and freshwater).

Such consents relate to resources for which government has management or ownership rights. They have been issued to date at no charge for the underlying resource which is likely to be causing excess demand and encouraging excessive expenditure on influencing allocation processes. This would change for aquaculture under the proposed reforms with tendering of the limited space which could reveal price data, but charging for freshwater is not currently proposed. Consents can be traded after issue (though locations may be fixed) but there is not distinct market or recording of values, which also vary in response to differences in the form of the consent and local factors.

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<sup>6</sup> Instead of applications being made and considered case-by-case throughout the coastal marine area, the proposal broadly involves defining zones within which only aquaculture can occur and outside which it cannot occur. Space could then be allocated within those areas by tendering or other mechanisms determined by councils.

Initial allocations of fishing quota in New Zealand were at no charge based on an implicit existing right derived from past catch history. Current values are however readily determined in a commercial market, except for quota covered by the Maori Fisheries Settlement which has a reduced value and limited market liquidity due to ownership restrictions. A deemed value process is used to charge for by-catch (fish caught but not covered by the fisher's quota holdings) and is based on market prices. For existing radio spectrum Telecom New Zealand was charged half of the tender price for new spectrum.

In the absence of markets the valuation of resources such as freshwater, or the ability to discharge to air or water, is subjective. There is also a wider question about the valuation of non-traded environmental benefits which are affected by either existing regulatory arrangements or proposed new use rights regimes. Some of these can also be valued in use terms, such as the ability to walk through a bush area or drink from or fish in a waterway, which it may be possible to obtain reasonable valuation proxies in terms of time spent or tourism revenue or the cost of equivalent commercial activities.

Other such benefits, however, have to be assessed in terms of existence values where people find the knowledge that such a feature exists to be of value even if they will never visit it themselves. Such valuations are inherently difficult to perform and open to criticism but equally are unavoidable. In designing a use rights regime either the initial policy decisions or the planning framework must take account of such issues in order to permit efficient use

Once value has been determined, the question will arise of whether there should be a specific charge for access to the resource. Relevant factors will include whether the activity has net positive spin-offs that would not occur under such a charge, the extent to which benefits are captured by existing tax regimes, and how the activities benefits are distributed. Practice varies widely.

### 3.5 Registration and trading

The value and reliability of a right will crucially depend on the supporting institutions; ie, the arrangements for registering it, tracking use and enforcement on the right holder and against third parties. Such institutions can be established by contract but this depends on having legally enforceable use rights. In the absence of existing generic structures, such as land, this will require statutory definition of the rights in question. Whether the registry or trading systems require government intervention will depend again on the extent to which generic regimes such as competition regulation apply, the existence of net benefits from a unified approach, and the political and social environment.

Consents under the RMA are transferable between owners, but not between types of activity or locations, reflecting the specific nature of the environmental assessment required before a consent is issued. This includes aquaculture consents. Mining permits for minerals are recorded by the Crown and can be transferred. Supporting resource consents are managed by councils as usual under the RMA.

Trading water is generally restricted to within the same catchment for management and environmental reasons, but even then may be complicated by technical barriers, even quite minor ones such as variation in pump sizes (Kearney and Sinner 1997). Water trading can also be restricted to within the same intended use to protect current users.

In 1999 77% of allocated water in New Zealand was for irrigation<sup>7</sup>, 7% for industrial use, and 16% for industrial water supply (Robb *et al* 2001). Water for hydro generation is not included in these figures which cover only abstraction, reflecting a wider difficulty in the statistical and legal classification and protection of non-abstractive uses of water.

As for use rights generally, before trading in water can occur “water rights systems need to be clarified .... and mechanisms set up to facilitate trade in water rights in order to strengthen the legal framework and institutions that enable the efficient allocation and use of water” (OECD 2003 :41). Such systems will only be set up where the benefits will clearly exceed the cost and there is sufficient urgency to overcome inertia. This combination of scale of both crisis and payoff necessary to justify action has apparently not yet materialised in New Zealand, although the current legislation to require planning and allocation to best use in the Waitaki catchment where irrigation and hydro generation are in conflict may indicate a change.

The process of defining carbon sink credits in New Zealand has already demonstrated the importance of defining the nature of rights, of demonstrating that they have or will have definite value, and establishing systems for tracking and trading them (though only government trading is currently envisaged). It has also shown the highly political nature of decisions about the initial allocation of rights (eg, over existing forests). All this has occurred even before confirmation of the activation of the Kyoto Protocol and the emergence of any true market for such rights, which depends on international activity given New Zealand’s status as a net seller in the initial period at least.

Fishing quota is recorded centrally and is freely transferable unless it forms part of the assets transferred to Maori as part of the 1992 settlement. A minimum quota holding is imposed to simplify enforcement.

The fishing experience in New Zealand has demonstrated the advantages of a clearly specified transferable right, with built in procedures for taking changes in the nature of the resource into account, in allowing the industry to grow and respond to market pressures while operating sustainably. Such markets have not developed for water or pollution rights. The reasons include problems in specification and valuation of rights, but also relate to issues of market procedures and size which can potentially be addressed through central facilitation of either standard or integrated registry and trading systems.

### 3.6 Transition

Establishing new rights means constraining existing ones, or to put it another way the “adoption of a new class of property rights will generally involve a shift in wealth towards the users of those rights and away from nonusers of the rights and from society at large” (Hansmann and Kraakman 2002 :42). In particular a new resource-related right automatically reduces existing defined or undefined rights over the same resource; eg, exclusive occupation for a marine farm reduces the rights of boaters or swimmers.

Interactions with other rights regimes can be one of the most complex aspects of establishing a new right. One example of this is the effect of separating the value of a right from the value of the land to which it relates. One example from New Zealand was the debate about separating the value of shares in dairy co-operatives from the value of farm land. Another more common example is water rights, where the separation can

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<sup>7</sup> About 80% of the irrigated area was in the Canterbury and Otago regions, of which about 70% was pasture.



affect local government through reduction in the rateable value of land,<sup>8</sup> unless the water is taxed as an improvement on the land (Kearney and Sinner 1997). Aquaculture is particularly complex as the proposed reforms involve first defining which areas can be used for aquaculture rather than the full range of other potential uses, and only then allocating the aquaculture space itself.

The incentives for those who receive new rights to support a change are obvious enough, “modifications occur because individuals perceive they could do better by restructuring exchanges” (North 1994 :361). However, what allows them to achieve their goals at the expense of those with existing interests or who would benefit from alternative new rights structures? There is limited understanding of the circumstances that facilitate or impede such transitions between rights structures; ie, “specifying the mechanism by which transitions occur” (Banner 2002 p360). How do we “achieve the efficient, competitive markets ... and economic rules of the game (with enforcement)” and “under what conditions does a path get reversed” and new institutions established (North 1991 :98 and 111)?

What we can say is that bringing in a new property rights regime requires dealing with the collective action problem (who will bear the cost of the work rather than free-ride, while avoiding unnecessary forced-riders) and transition costs such as valuation and allocation (Banner 2002). It also requires dealing with vested interests through trade-offs, grandfathering of rights or by political fiat. Those interests can be very local and individual, or reflect wide social or sectoral views such as preference for water rights to be retained within agricultural uses, or within existing regions, or for rural versus urban communities, or even a fear of monopoly control (Kearney and Sinner 1997).

Grandfathering is one of the most common mechanisms for achieving change, as long as the benefits overall exceed the costs of such measures, because it reduces the impact on vested interests. When introducing transferable rights the effects of such measures on the initial allocation may not matter provided that barriers to subsequently transferring the rights to alternative users are low enough; i.e. the Coase Theorem. (Coase 1988)

These issues have not been explored extensively in New Zealand with the exception of fisheries quota and “allocation issues are not explicitly provided for in the RMA, which specifies only the use of the resource consent process” (NZBR 1995 :25). Where transferability is limited, however, the costs of initial misallocations can be high (Guerin 2003b). Grandfathering can also affect the legitimacy of the new regime if it is seen as buying off some parties or as favouritism and can reduce the level of revenue available to government for covering implementation costs or funding offsetting activities.

In the fisheries example in New Zealand, the introduction of quotas has been based on previous fishing history as a means of managing existing interests and smoothing the transition. In practice this caused major disputes around which historical data was used and inconsistencies in policies and application. For radio frequencies the approach was to tender new space and charge a discounted fee for existing users, easing the new entrants but also protecting the position of the incumbents while limiting their opposition to the change. This is an area where the historical structure of the sector and political realities and perceptions of fairness appear to matter as much as theoretical market efficiency. It is seldom practical to ignore such factors.

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<sup>8</sup> *Water reform plan faces torrent of legal opposition*, The Australian Financial Review, 16 June 2003, p8

Transitions also take time. This is because of the complexities of establishing the new rules, registers and information sets, but also because people take time to adjust to and accept the new arrangements. “Institutions will be stable only if under girded by organizations with a stake in their perpetuation” and “developing norms of behaviour that will support and legitimise new rules is a lengthy process” (North 1994 :366).

## 4 Law and Institutions

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There is little point in designing a new rights framework without taking account of the structure in which it will need to operate. “The choice of an agent responsible for the implementation of a system of economic instruments, and the careful construction of incentives that support policy objectives, can be just as important as the introduction of economic instruments” itself while “governments must also acknowledge that policy-making takes place only within the context of formal and informal institutions that are key to success” (Andersen 2001 :23-24).

One element of this is existing perceptions of property rights by users and other stakeholders. Any changes will need to allow for resistance due to such perceptions and for time-lags in the adjustment of perceptions once the changes are in place. Other key institutional elements are the legal framework and central and local government structures.

### 4.1 Statutory Frameworks

A key issue for designing use rights is the extent to which their implementation will require changes to the existing legal framework. This can range at the central government level from legislative amendment to regulatory change to statutory codes, and at the local government level from plan changes to new rules to new bylaws. To the extent that changes can be made generic, and therefore limit the complexity and frequency of formal processes and the difficulty of compliance, there are clear advantages in doing so. The key pieces of legislation will be the RMA and the Local Government Act (LGA) 2002.

The RMA allows the use of some economic instruments such as financial contributions to offset environment impacts, non-compliance fees or fines, bonds, transferable development rights and in some circumstances transferable permits (Kearney and Sinner 1997). It is not, however, seen as encouraging or particularly facilitating such mechanisms and limits the ability of councils to operate use rights schemes through its restrictions on how and when coastal<sup>9</sup>, water<sup>10</sup> or discharge permits<sup>11</sup> can be transferred.<sup>12</sup> The Act also constrains councils by preventing transfers of parts of a consent, constraining maximum terms of consents, and not allowing for non-use of resources (consents cannot be issued for non-use and consents for use automatically lapse if not

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<sup>9</sup> S.135. Coastal permits may be transferred to another person, but not to another site, unless in each case a regional coastal plan expressly provides otherwise.

<sup>10</sup> S.136. Permits for damming or diverting water may be transferred only to owners or occupiers of the same site. Other permits may be transferred only if allowed in a regional plan and approved by the consent authority.

<sup>11</sup> S.137. Discharge permits may be transferred only to owners or occupiers of the same site.

<sup>12</sup> There may be valid reasons why transferring a consent between locations should not be allowed but a blanket legislative restriction appears excessive, preventing councils from assessing such risks within plans and hindering use of trading mechanisms to manage pollution within an air-shed or catchment.

used within five years, or longer specified period).<sup>13</sup> The Coastal Tendering provisions of the RMA (Part VII) have not been used. A new regime for defining aquaculture management areas (AMAs) and tendering space within them is now being developed.

The LGA now provides councils with greater discretion in their own activities through the power of general competence but this does not extend to regulatory powers which are specified and constrained by procedures or to taxing arrangements, which are limited to rates on land under the Local Government (Rating) Act 2002. It also facilitates joint provision of services or transfer of responsibilities to other councils which can help address capability and economy of scale issues.

Use rights can take a number of forms of varying complexity but do involve a minimum cost in development and implementation which must then be offset by benefits. In the New Zealand context, generally only central government will be in a position to undertake that work but the regime must then be capable of implementation by regional councils of varying scale and competence across what can be quite small individual markets, such as specific river catchments. This leads towards a strong preference for as simplified a core statutory framework as possible, designed for councils to pick up and apply wherever it may be feasible to do so.

## 4.2 Central and Local Government

Both central and local government have roles in defining and operating use rights regimes, with the extent of central government involvement depending on factors such as the degree of national interests in particular locations or resources (eg; climate change policy and renewable generation) and the degree of regional variation in resource availability and use. Some issues will be better dealt with at regional or local, rather than national level. This will be particularly the case where the impact is constrained such as within a river catchment, or where transport costs allow local price differentiation, such as for waste disposal.

The RMA provides for central government to set priorities and rules through National Policy Statements (NPSs) and National Environmental Standards (NESs), but these have not been used to any real extent which has limited the guidance available to regional councils in performing their tasks and allowed more regional variation than was perhaps originally expected.

There are also variations in regional councils' resources and performance, part of which reflects their sheer diversity in scale. This factor, combined with the national significance of some issues faced by councils, can lead to calls for central government support which can cause conflicts with the clear division of responsibility between the levels of government and risk undermining the financial independence of local government. Better legislative frameworks to support resource assessment and allocation, and expanded guidance for local government on how to design and implement regimes, are less problematical but there is a question of whether these can deliver enough support. A distinct issue is the extent to which national and local interests and priorities can diverge, resulting in decisions that clash with the national interest or delays in implementing

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<sup>13</sup> Defining non-use can be technically difficult, such as for water where flows left in the river may be abstracted further down (unless they are used to increase minimum flows), and can raise competition concerns. There are, however, merits in allowing for those who value non-consumptive uses such as land not grazed or water left in rivers for environmental or recreational purposes to be able to buy resource rights for that purpose.

centrally supported initiatives. These are factors that must be considered in designing a use rights regime which depends on local implementation.

## 5 Conclusion

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One of the key differences between use rights and other forms of economic instruments is the infrastructure needed to operate them, in terms of defining the nature and quantum, right and its relationship to other rights, tracking who owns it, and providing for its exchange. The payoff for the creation of this infrastructure is a greater ability to control and optimise the use of the underlying resource.

Other economic instruments, such as taxes and fines operate within existing rights frameworks so can be implemented more easily but are also constrained by the coverage of those frameworks. This means that introducing new systems of use rights is appropriate only when the benefits from the creation of that infrastructure exceed the costs. “Theory has much to offer environmental protection, but in the end, local culture, institutions and infrastructure will determine the success of any policy” (Bell and Russell 2003 :25).

Such new systems are seldom easy or quick to create. There is no generic legislation in New Zealand (or even adequate provisions within the RMA) giving the support structure needed for such endeavours so measures such as fishing quota, aquaculture management areas and carbon credits have required specific legislation. These regimes have also required a major effort in time and resources to get up and running and then to refine. New systems, such as potentially for water, are also unlikely to be simple to create and may lend themselves less to national approaches which in itself will delay progress given the limited resources of regional councils and the importance of scale (and market liquidity for certain types of rights) in determining the viability of use rights approaches.

These problems demonstrate the potential advantages from providing structures for specifying rights, gathering the supporting information and administering them in as generic a fashion as possible in order to achieve economies of scope and scale. Instruments such as national policy statements offer some scope for this and the Local Government Act facilitates joint provision of services by regional and territorial councils, but there still appears to be scope for improved statutory support for use rights within the RMA along with other forms of non-prescriptive regulation, and for greater efforts to provide guidance for local government and other stakeholders on how such regimes can help them and on how to put them in place most efficiently.

Designing new institutions such as registries and research programmes in a manner that could be used to support a range of activities would also be desirable. This could include testing of options using techniques from experimental economics to narrow down viable options at much lower cost than post-implementation changes.

Communications is also an area for focus. There is a reluctance to create or acknowledge any private rights to some resources, in particular rights to take water or discharge to air or water. Such concerns have been less significant for fishing, minerals or radio frequencies. This requires perhaps some illustration of how such approaches can create incentives that improve outcomes for society, such as higher economic returns or lower cost reduction of pollution.

It is difficult to identify in advance where the net benefits from such moves will be greatest, or even exist, and this paper has not attempted to do so. Rather, the suggested approach is to think beyond both the theory and the specifics. This means looking at how, given limited resources and diverse governance structures and markets, it might be possible to facilitate broad adoption of a core set of use rights to achieve a range of environmental, economic and social goals.

Such a facilitative or empowering approach avoids prejudging where the greatest benefits will come and over-investing in specific areas. It creates an environment that allows multiple experiments, while leaving scope for guidance to narrow down those experiments where appropriate. This is not an easy prescription, but given existing commitments to a range of goals, limited resources to invest in intensive regime development which may not be justified by outcomes, and the likely cost and difficulty of managing conflicts within more prescriptive regulatory methods, it may be the best practical option.

## References

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- Andersen, Skou (2001) "Economic instruments and clean water: Why institutions and policy design matter." Paris, Organisation for Economic Co-Operation and Development.
- Banner, Stuart (2002) "Transitions between property regimes." *Journal of Legal Studies* 31(2 (pt.2)): 359-372.
- Bell, Ruth and Russell, Clifford (2003) "Ill-considered experiments: The environmental consensus and the developing world." *Harvard International Review* 24(4): 20-25.
- Coase, Ronald (1988) *The firm, the market and the law*. (Chicago: University of Chicago Press).
- Duke, Charlotte (2004) "Salt property rights to manage saline impacts from irrigation, a policy design economic experiment." (Melbourne, Australian Agricultural and Resource Economics Society Water Workshop)
- Ford, Stuart, Geoff Butcher, Kathryn Edmonds and Andrew Braggins (2001) "Economic efficiency of water allocation." Wellington, Ministry of Agriculture and Forestry, Technical Paper No 2001/7. <<http://www.maf.govt.nz/mafnet/rural-nz/sustainable-resource-use/water-efficiency/economic-efficiency-of-water-allocation/water-allocation-technical-paper-7.pdf>>
- Guerin, Kevin (2003a) "Encouraging quality regulation: Theories and tools." Wellington, New Zealand Treasury, Working Paper No 03/24. <<http://www.treasury.govt.nz/workingpapers/2003/03-24.pdf>>
- Guerin, Kevin (2003b) "Property rights and environmental policy: A New Zealand perspective." Wellington, New Zealand Treasury, Working Paper No 03/02. <<http://www.treasury.govt.nz/workingpapers/2003/03-02.asp>>
- Haddad, Brent (1997) "Putting markets to work: The design and use of marketable permits and obligations." Paris, Organisation for Economic Co-operation and Development, Public Management Occasional Papers No 19. <<http://www1.oecd.org/puma/regref/pubs/PUMAOP19.pdf>>
- Hansmann, Henry and Kraakman, Reinier (2002) "Property, contract and verification: The numerus clausus problem and the divisibility of rights." *Journal of Legal Studies* 31(2 (pt.2)): 373-420.
- Kearney, Mike and Jim Sinner (1997) "Transferable water permits: Two case studies of the issues." Wellington, Ministry of Agriculture and Forestry, Technical Paper No 97/12. <<http://www.maf.govt.nz/mafnet/rural-nz/sustainable-resource-use/water-efficiency/transferable-water-permits/tradwat.pdf>>
- North, Douglass (1991) "Institutions." *Journal of Economic Perspectives* 31(5(1)): 97-112.
- North, Douglass (1994) "Economic performance through time." *American Economic Review* 84(3): 359-368.
- NZBR (1995) *Reform of the water industry*. (Wellington: New Zealand Business Roundtable).
- OECD (2003) *Improving water management: Recent OECD experience*. (Paris: OECD).
- Robb, Christina, Matthew Morgan and Simon Harris (2001) "Attitudes and barriers to water transfer." Christchurch, Lincoln Environmental, Report No 4464/1. <<http://www.mfe.govt.nz/publications/water/attitudes-and-barriers-to-water-transfer-dec01.html>>
- Roth, Alvin and Peranson, Elliott (1999) "The redesign of the matching market for American physicians: Some engineering aspects of economic design." *American Economic Review* 89(4): 748-780.