



Choosing between incentive mechanisms for natural resource management:

a practical guide for regional NRM bodies.

Emma Comerford and Jim Binney, Queensland Department of Natural Resources and Mines.



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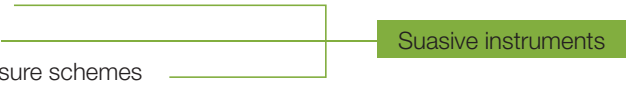
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A. Introduction

There is currently great interest in the use of economic and social incentives for natural resource management (NRM), as has been demonstrated by the support for these policy tools by the funding programs of the National Action Plan for Salinity and Water Quality (NAPSWQ) and Natural Heritage Trust. Regional NRM bodies have also shown awareness of the potential for such tools as they provide the opportunity to deliver regional NRM in a more efficient manner than some more traditional approaches. This paper is designed to assist regional NRM bodies decide which incentive mechanisms should be applied to particular situations. It will not provide a definitive answer for any situation. A regional NRM body will probably need to seek specialist advice from economists and biophysical scientists before designing and implementing incentive mechanisms.

This paper contains the following sections:

- Part B contains a summary of some of the ideas behind the choice of management tools. This section and the whole paper are focussed on incentives – it is not intended that this paper debate the use of incentives versus other management tools.
- Part C explains the rationale behind using incentive mechanisms.
- Part D lists the incentive mechanisms that regional NRM bodies can directly use to influence NRM outcomes. These incentives are
 - Grants
 - Subsidies
 - Stewardship payments
 - Competitive tenders for conservation contracts for a variety of NRM outcomes
 - Negotiated outcome
 - Education and training
 - Information provision
 - Social recognition/pressure schemes

The diagram shows a green box labeled 'Suasive instruments' with three lines extending to the right from the text items 'Education and training', 'Information provision', and 'Social recognition/pressure schemes' in the list above, indicating that these three items are categorized as suasive instruments.
- Part E lists the incentive mechanisms a regional NRM body can indirectly use to influence NRM outcomes.
- Part F explains what background information a regional NRM body should have before attempting to choose an incentive mechanism(s). The questions posed in this section are concerned with understanding the context in which the use of incentives are proposed. These issues will probably have been addressed through the planning process.
- Part G consists of a series of questions that are designed to help regional NRM bodies determine the appropriate mechanism(s) for the situation they are looking at.
- Part H gives tips for tailoring the chosen incentives to your regional needs.
- Part I provides a reference list (with internet links where possible) of key references.
- The first appendix has a brief discussion of key incentive mechanisms and a summary of their most appropriate uses. Individual incentive mechanisms will not be defined within the body of this document, so **it is recommended readers use the appendix or the reference documents if they are unfamiliar with a mechanism.**
- A second appendix presents a table summarising the main benefits, problems and suitability of different incentives, as well as suggesting possible methods of indirect support by regional NRM bodies.

The use of the term “regional NRM body” encompasses the regional organisations in Australia’s states and territories that are responsible for delivering NAPSWQ and Natural Heritage Trust funds. Each state/territory has a different arrangement for its regional organisations, with different names and powers given in different areas.¹

¹ For more information on the different regional arrangements, go to <http://www.nrm.gov.au/about-regions/index.html>

B. Choosing between policy options

Regional NRM bodies have a number of choices of actions to achieve improved NRM outcomes, including economic instruments and “suasive” measures such as social recognition schemes, both of which often use incentives to encourage management change. Before choosing an incentive, it is important to recognise that incentives are only part of a suite of policy tools to effectively address NRM problems. Incentives alone cannot achieve improved NRM outcomes. For example, regulation may be an appropriate response to a situation where greater certainty of outcome is necessary (Gunningham and Young 1997). Regulations (whether new or amended) are often necessary to underpin other policy measures. For example, load based licensing is an incentive mechanism that requires changes to current regulations. Regional NRM bodies are unable to directly implement regulations or change existing regulations. However, as a stakeholder in NRM, regional NRM bodies may find it appropriate to approach the local, State or Australian governments to recommend regulatory changes. Direct action such as land purchase may also be an appropriate choice, such as when a property has extremely high ecological value and strict conservation practices are required. A mix of policy responses is likely to achieve the desired NRM outcome. ABARE (2001) has identified the following factors influencing the choice of policy options:

- The **expected costs and benefits** (if cost is too high intervention may not be justified). The relative costs and benefits compared to other measures should be identified.
- The expected **effectiveness** of the instrument in achieving the defined targets.
- **Efficiency** concerns relating to the administration, monitoring and enforcement costs and the level of information required.
- **Flexibility** of the policy to deliver an optimal outcome in the face of changing conditions and the extent to which individuals can determine their response to the policy.
- The **acceptability** of the policy to stakeholders. This is especially important with incentives, as the take-up of an incentives program may be low if the individuals or community do not welcome the policy.
- **Equity** concerns about the impact of the policy upon stakeholders.



Obviously, some of these issues may be difficult to evaluate before implementation. One option for dealing with uncertainty is to trial a mechanism before implementing it on a large scale. Additionally, some information on the likely costs and benefits may be gained from other group's use of similar mechanisms.

C. Rationale behind using incentive mechanisms

The underlying rationale behind using public money to support NRM is that sometimes the private benefits from an action are less than the public benefits. This results in an underprovision of improved NRM, as the landholder will only carry out the action if there are enough private benefits to be gained to justify the costs. For example, preventing soil running off a property can benefit a farmer's production of crops. However, the farmer may not carry out expensive soil retention works if the cost of doing so outweighs the benefit they think they will gain. (This cost includes the opportunity cost of any lost productivity as well as the direct cost). But society would like them to carry out the works as the wider benefit (for example improved water quality) is greater than the cost.

This can be seen in figure 3, where A is the level of NRM protection that will probably occur without any intervention – this is where the private benefit equals the cost. However, B (a higher level) is where society would rather be – this is where social benefit equals the cost.

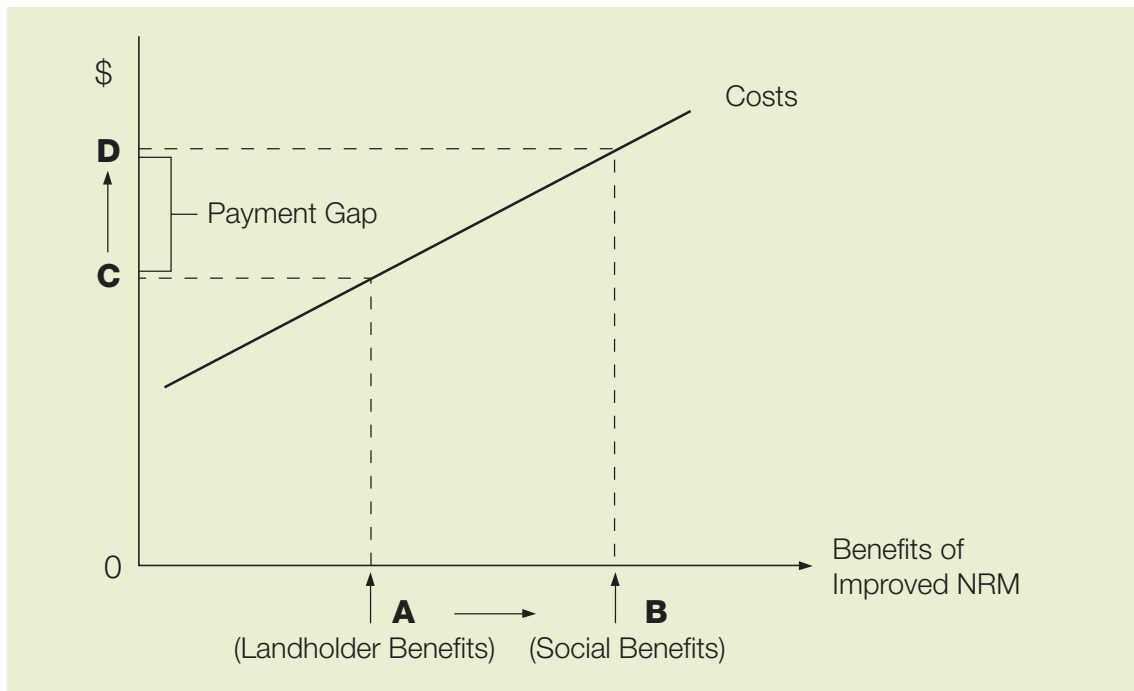


Figure 1: Gap between social and private benefits. (Comerford, Binney and Clouston 2005).

The gap between the private and public benefits will vary depending on the NRM practice sought. For example, protecting a wetland may provide little private benefit but a high level of public benefit (so the gap will be large). Spelling cattle on grazing land may provide a fairly high level of private benefits through the maintenance of pasture cover (so the gap will be narrow).

Sometimes private landholders may not even be operating at a level that produces A, where the private benefits already justify undertaking the work. This might be because they lack the information to realise the private benefits from a change in actions. In this situation, information provision and training may be appropriate actions for the regional NRM body. Alternatively, the landholder may not be operating at point A because the private benefits may only become apparent after a certain period of time. For example, conservative stocking rates that support the maintenance of high groundcover may not provide productivity gains for several years. If there are substantial public benefits associated with such a change, it might be worthwhile financially supporting landholders until the private benefits of change become apparent (and they should then be motivated to carry on alone). Regional NRM bodies will have to decide if this is likely to be true in their area, as this is not in keeping with the widely held principal of not funding private benefits.

The support that has arisen for incentive mechanisms is based upon a variety of perceived benefits, which can be categorised as the following:

- Incentives may be more cost effective than other tools, as generally landholders with low compliance cost will choose to respond to a voluntary incentive rather than those with a high compliance costs.
- Greater flexibility than some other measures as often participants will be able to choose how to respond to the incentive mechanism rather than having prescribed management actions.
- Greater encouragement of diversity and innovation in responding to incentives.
- Continued improved performance over time (for some incentives), as compared to a regulation where only the required compliance level will be met.

Possible downsides to the use of incentive mechanisms include:

- There is a risk that communities may come to expect a financial incentive before undertaking NRM work once a precedent is set.

- Because incentives are voluntary, uptake may be lower than under regulation and so the biophysical outcomes may be negligible. Additionally, key people/companies may choose not to participate, which may also undermine the NRM outcome. These problems can be somewhat ameliorated by careful incentive design and implementation (for example by having a sound communication strategy).
- Transactions costs may be higher for incentive mechanisms than for some other policy options such as regulation.
- Designing and implementing a market is a difficult process that requires high levels of expertise and the right setting to successfully operate. Early results from the National Market-based Instruments Pilot Program have indicated that establishing tradeable permit or credit markets is more complex than anticipated.

This paper assumes that a regional NRM body has assessed the current NRM situation and has decided to use incentives in their planning. This document will not assist with identifying all options for a particular problem, but will help regional NRM bodies decide which incentive will suit their problem.

D. Which incentives can regional NRM bodies directly implement?

There have been numerous papers written describing the range of incentives available for NRM (such as James 1997, IC 1997, ABARE 2001, Robinson and Ryan 2002 and Agtrans Research 2003). A brief summary of the various incentives is attached in the appendices.

Regional NRM bodies are limited in the selection of incentives they can directly apply. Only the Australian and State governments can introduce or modify taxes, and only local governments can offer rate relief. It is likely that most regional NRM bodies will be unable to modify property rights and independently establish a tradeable permit system, or set up new offset programs. Each state and territory has different arrangements for its regional NRM bodies, and so the range of mechanisms that can be used is different for each jurisdiction.

However, generally regional NRM bodies can use the following incentives to directly influence NRM:

- Grants
- Subsidies
- Stewardship payments
- Competitive tenders for conservation contracts for a variety of NRM outcomes
- Negotiated outcome
- Education and training
- Information provision
- Social recognition/pressure schemes

The final three mechanisms listed here are suasive instruments, which occasionally act as incentives for people to change their behaviour. They are also excellent complementary strategies to other incentive mechanisms.

All of these incentive mechanisms use public funds to encourage landholder provision of environmental goods and services. This is based on the beneficiary pays principle, which requires those that benefit from improved environmental standards bear the cost of meeting the higher standards. Sound cost-sharing guidelines are required to ensure that only the social benefits from an action are supported by public funds (Comerford, Binney and Clouston 2005).

E. Which incentives can regional NRM bodies indirectly use or promote?

There are also incentives that regional NRM bodies can use indirectly to influence NRM. This involves supporting and coordinating incentive mechanisms from other groups, such as local governments in the region. This indirect support could take the form of financial support for other bodies to undertake the incentive – for example, a regional NRM body could fund a rate rebate program for local governments that might not otherwise be able to afford the revenue loss. Another supporting role could be to provide information on regional priorities and the establishment of schemes to support these priorities. Alternatively, the support could be lobbying for the extension of current incentive schemes or the establishment of new incentive schemes. Negotiating with State and Australian governments is likely to be more effective if regional NRM bodies work collectively to encourage a desired change. Regional NRM bodies can also play a key role in advertising incentive schemes run by other levels of government, such as voluntary conservation agreements by local governments and tax concessions by the Australian and State governments. The main incentives that regional NRM bodies can use indirectly include:

- Rate rebates
- Tax concessions
- Voluntary conservation covenants and agreements

There are other incentives that regional NRM bodies could indirectly use, but these are likely to involve supporting another program in a more peripheral manner. For example, through assistance with information gathering, a communication strategy or monitoring the trial. Of course, individual circumstances will vary between areas, and a regional NRM body could be involved in a research project developing or testing the following incentive mechanisms. For example, some regional NRM bodies have participated in National Market-based Instrument Pilots. Other bodies have been able to assist in the delivery of incentives that are part of state regulations and programs, such as the Catchment Management Authorities (CMAs) of NSW assisting with the organisation of vegetation offsets. However, the incentives below cannot currently be independently designed and implemented by regional NRM bodies, and so are only indirectly dealt with in this paper. These incentives include:

- NRM taxes (such as effluent charges)
- Differential product development
- Changes to leasehold agreements
- NRM offsets
- Performance bonds
- Establishment of trading markets (including credit trading markets)
- Transferable development rights

These incentives are not outlined in the appendix, as they are less likely to be employed. However, the hyperlinked references contain information on their design and use.

F. Necessary background information before choosing and using an incentive

Before choosing and implementing an incentive program, a regional NRM body should have gathered and clearly articulated information concerning the NRM problem and possible solutions. These solutions will be management actions that maintain NRM values or improve the NRM outcome, such as protection of vegetation or protection of riparian zones through fencing. Information about the characteristics of the potential participants is also necessary before choosing and designing an incentive. This background information helps ensure the correct incentive is chosen, that it is well designed and increases the likelihood of the incentive/s meeting the objectives of the regional NRM body. Below are a number of issues to be addressed to assist regional NRM bodies determine the most effective incentive mechanism(s) for the situation.

What's the NRM problem being addressed?

The regional body NRM plans will have identified priority NRM problems in their region, such as overgrazing in a particular area resulting in water quality problems. The regional NRM body should be aware of the available level of biophysical knowledge about the problem. Characteristics of the problem, such as its sources and impacts should also have been identified. For example, are there diffuse sources of pollution that lead to a water quality problem, or are there point sources? Areas of higher priority should be identified. Finally, before spending money on the problem it should be established if the decline in NRM condition can be reversed.

What's the objective/s?

The regional body NRM plans will have outlined and prioritised NRM targets for different areas of the region. It is important to aim an incentive at a desired outcome. Sometimes it is possible to achieve more than one outcome with a management action, such as when revegetation assists with water quality and biodiversity targets.

In most cases, objectives will not only be for NRM. Economic and social objectives may need to be achieved as well, and these objectives may sometimes conflict with each other. For example, economic efficiency in competitive tender for conservation contracts may conflict with the desire to engage key stakeholders. Although there is no simple answer to these conflicts, it may be best to explicitly acknowledge that there are multiple objectives to many incentive programs, and allow some flexibility in the program to deal with these objectives and any conflicts that arise.

What's the current management situation and what needs to be changed?

It is important to review the current management situation and identify possible actions that could assist with achieving NRM objectives. For example, changes in land management (such as the adoption of more efficient irrigation systems and practices) may help alleviate potential salinity problems. Incentives can then be targeted at these changed management actions. Once again, the regional plan should incorporate this information.

A complicating factor in many situations is that there are a wide range of actions that contribute to a problem and many benefits that result from a different action. If possible, the main impacts and benefits of actions should be roughly identified. This will help if specific actions are to be targeted.

Some incentive mechanisms are more suitable for when a “package” of management actions are to be targeted. For example, negotiated outcomes and competitive tenders provide flexibility in creating a management plan that incorporates a range of suitable actions. Grants can also allow for a range of management actions, although there is usually less scope for negotiating the package with the landholder. Grants can obviously be used for single actions as well. Stewardship payments can be for a negotiated package or for a set action. Subsidies are best suited to one management action.

It is important to realise that unintended negative (perverse) outcomes might result from a poorly planned management action. For example, subsidising a weed control chemical without ensuring appropriate training may result in either the frequency or timing of applications leading to poor water quality. Therefore seeking expert advice on the possibility of perverse outcomes arising from the management actions to be promoted would be prudent.

Who are the people targeted?

It is important to identify whose behaviour is being targeted in order to meet the NRM target. The incentive chosen will have to be designed to affect the behaviour of these individuals or groups, keeping in mind the estimated costs and benefits associated with the proposed changes, and the likely impacts of these costs and benefits. The main barrier to the change in behaviour should be identified (for example, lack of desire to support production of public goods) and an incentive chosen that addresses this barrier. Similarly, the potential private and social benefits of the change should be identified and communicated to the participants through the associated communication strategy.

The identification of the economic and social capacity of the landholders to undertake management actions will help identify the level of incentive necessary to induce the desired change. Factors such as the financial status of producers in the area and their average knowledge levels can impact upon the design of an incentive mechanism and its success. This information should be contained in a comprehensive regional profile. An alternative method to obtain this information is to hold a focus group in the community involved. It is important to be aware that there may be an incentive for potential participants to overstate the costs of change.

Another consideration that may impact upon the design and reception of an incentive program is the range of pressures the landholders are under due to legislation, such as the new vegetation management laws in Queensland and New South Wales. Identifying these pressures will help regional NRM bodies understand which incentives are more likely to be appealing. For example, if the regional NRM body wants to encourage changed grazing practices, but landholders are experiencing uncertainty about requirements under new legislation, the landholders may be unlikely to want to change their practices. In this case, an incentive package aimed at clarifying the benefits to changing grazing practices and perhaps financially supporting some key changes, may appeal to the landholders.

An additional social factor affecting the success of an incentive mechanism is the state of relationships between the landholders and the regional NRM body and the State and Australian Governments. If relations have been antagonistic, it may be necessary to allow extra time to introduce and explain the incentive program. An incentive program such as training and education campaigns could be aimed at landholders who currently lack the skills and knowledge to implement recommended changes, or who may misunderstand the implications of the incentive being offered. Uptake of the incentive mechanism is likely to be greater if the organisation providing the on-ground delivery has an established positive relationship with targeted landholders. If regional NRM bodies lack this relationship, they may want to consider joint delivery of their incentive program with other parties, such as industry bodies or environmental organisations.

What actions are the responsibilities of individual landholders?

There is a difference between actions that are the responsibility of individual landholders and primarily generate a private benefit and actions that primarily generate a public benefit. This difference should be delineated as clearly as possible, so that the actions that principally provide a public benefit can be supported. Identifying this difference allows for an equitable and efficient use of funding. For example, revegetation may have private benefits such as soil retention, use as a windbreak and shelter for stock. It is expected that landholders would supply revegetation for this purpose. However, revegetation may also contribute to an area's biodiversity, which is valued by many people beside the landholder. This public benefit element of revegetation may warrant the use of incentives to encourage its establishment. It would also be expected that incentives are not used to encourage farmers to undertake actions that should be undertaken as part of their "duty of care" towards their land. This concept can be difficult to define, however, and should be used with

caution. A simple interpretation could be that landholders are not paid to undertake actions that are required by legislation.

What capacity does the Regional NRM body and community have to design and deliver the incentive?

It is important to identify the capacity of the regional NRM body to design and implement any incentive mechanisms. Identifying the amount of money available to spend on the mechanism itself and on any support necessary (for example hiring consultants or additional staff) is vital to planning. Systems to plan, monitor and enforce the agreements developed with fund recipients will need to be developed. Identifying the skills of the staff members of the regional NRM body will assist in choosing an incentive mechanism and in deciding if outside assistance is necessary.

Similarly, the capacity of the community to be involved in delivering and using the incentive mechanism should be borne in mind, especially if it is intended to utilise volunteer labour. Volunteer NRM groups may have a lot of pressure placed upon their resources, and may not be able to implement another program without risking “burnout”. This highlights the importance of communicating with stakeholders in the planning process.

G. Questions informing the choice of incentive instruments

Particular characteristics of the area in which the incentive will be used mean that some incentive mechanisms are better suited than others. The questions in this section may assist Regional NRM bodies narrow down which incentive mechanisms are the most appropriate for them to use and promote.

Are there many potential participants?

The number of people participating in an incentive mechanism can affect the usefulness of different instruments and the likelihood of success. Incentive mechanisms that rely on competition to generate an NRM benefit at the lowest economic cost, such as competitive tenders and cap-and-trade markets, are more appropriate to situations with greater numbers of participants. This is particularly the case where achieving the management target does not require all potential landholders to participate. It should be noted, though, that a competitive tender could be designed to allow for cooperation between neighbouring properties. Another mechanism, such as stewardship payments or negotiated outcomes, may be more appropriate to situations where there are fewer participants, such is the case in catchments dominated by a few pastoral holdings.

Is the problem in a particular area or widespread?

Some incentives are suited to problems that are being targeted in a particular area. For example, areas with high biodiversity value or acting as a major source of water pollutants may have been identified as priority action areas. Incentives that may otherwise be too complicated or administratively expensive on a larger scale are possible in this type of situation. In particular, competitive tenders and negotiated outcomes are practical in a problem being targeted at a smaller scale. (In the case of a competitive tender, there should be enough people to make a process competitive and worthwhile, as stated in the first question. If joint bids are to be permitted there must be enough groups to generate competition. Competitive tenders may be feasible at a greater scale, depending on the resources of the regional NRM body). When a problem is more widespread, for example an extensive weed infestation, other incentive mechanisms such as grants and subsidies may be the most practical incentive option.

When a problem extends beyond regional NRM body boundaries, it is likely that cooperation with neighbouring regional NRM bodies, the appropriate State departments/agencies and local governments might be necessary. Additionally, industry groups could be involved, perhaps through incorporating changes into their best practice guidelines.

Does there need to be a lot of control over the process?

In some instances careful control over the properties targeted and the actions taken will be necessary. For example, a weed spread by watercourses may need to be tackled from the upper catchment before trying to deal with it in the lower catchment. Mechanisms such as competitive tenders and tradeable permits do not easily allow for this type of control. In this situation, directed grants, subsidies and negotiated outcomes may be the best instruments.

Is the source of the problem to be overcome diffuse or can it be pinpointed?

Diffuse pollution comes from many different sources whilst point-source pollution comes from a few easily identified sources. It should not be difficult to identify if the source of a problem such as pollution is diffuse or point source, yet this may impact significantly on the choice of incentive. Point source problems are easier to monitor, and as such a wider set of incentive mechanisms are appropriate such as taxes and trading markets (both of which can only be used indirectly by regional NRM bodies) are suited to this situation. However, these incentives will probably not perform as well for managing diffuse source problems. Grants, subsidies and competitive tenders are able to target actions on private lands that contribute to diffuse problems, such as maintaining riparian vegetation.

Is there a substantial amount of biophysical information about the problem?

The amount of scientific knowledge surrounding the NRM problem should be established before choosing an incentive. As well as informing the planning and priority setting process, this assists with identifying behaviour changes and management actions to be targeted with incentives. Although all management actions will perform better if they are backed by a significant amount of biophysical knowledge, some instruments involve a high level of risk if there is inadequate biophysical information about the problem being targeted. For example, NRM offsets have a high risk of failing to deliver reliable NRM outcomes if there is not sound scientific knowledge underpinning the process. If the full suite of cumulative NRM impacts cannot be predicted, an unintended NRM loss may result. Multiple benefit competitive tenders are also likely to be more difficult to design and implement under conditions of biophysical uncertainty, particularly when the relationships between the objectives (eg: tree density and ground water flows) are difficult to define accurately at the scale of the action, both in their spatial and temporal impacts. If there is great uncertainty about the relationship between actions and NRM outcomes, care should be taken in using incentives to promote the questionable action. However, it is also important when designing any management plan to remember that planners will never have perfect knowledge and will need to operate under information constraints. Compromises will probably have to be reached between certainty of outcome and practicality. Pilots and trials that include significant monitoring and evaluation components are appropriate in this type of situation, as they improve understanding with less risk involved.

Are the properties similar to each other?

In some areas, properties are similar to each other with regards to size, NRM problems and business profits and costs. These properties may hold similar costs of changing behaviour based on a variety of factors such as farm profitability, presence of off-farm income and expectations about the future. These costs are known as opportunity costs. Some incentive mechanisms are likely to work better than others when opportunity costs differ between properties (and vice versa). For instance, if properties hold very similar opportunity costs, a competitive tender is unlikely to generate cost savings by capitalising on differing opportunity costs. Similarly, a cap and trade mechanism is unlikely to generate much trading when opportunity costs are similar between properties. In this case, a fixed price scheme, such as a subsidy, grant or stewardship payment, may be the more cost-effective option. The fixed price payment involved should be based on the estimated opportunity costs of change. This is easier to estimate when the costs are similar, and should result in less over-payment than in a setting where the costs vary greatly.

Is the tool likely to be acceptable to the community?

An incentive mechanism is more likely to be successful if the community accepts it. (The exception to this is when a disincentive such as a charge is introduced, as community acceptance is not necessary for a change in behaviour to occur). It may be useful to seek community opinion on which incentives would be most welcome. For some less common incentives, such as competitive tenders and stewardship schemes, it may be necessary to provide detailed information about the mechanism to enable potential participants to develop more confidence in the process.

Is there a set funding timeframe?

Some regional NRM bodies are not presently guaranteed a set source of funding for longer than a few years. This creates an operational constraint to using some types of incentive programs. For example, assisting with the establishment and running of a long term stewardship payment would not be practical for some regional NRM bodies. It may not be preferable to deal with NRM problems with long term management needs on a short term basis. However, the political reality of funding cycles may mean that sub-optimal options may have to be chosen. For example, an ongoing competitive tender process over many years may lead to an optimal outcome, but may not be practical in many situations. There may also be problems with long-term agreements with landholders that require payments to be made at set points in the future. Additionally, although regional NRM bodies have committed and valuable staff, it can be difficult to manage human resources in an environment of funding uncertainty. This is because applicants may not be attracted to short term contracts, and because there may also be a high turnover of staff in the position. This may undermine the effectiveness of on-ground officers, as they have to build up local knowledge and community support over time.

Many types of programs, such as competitive tenders, grants and education programs, are applicable to a short-term funding situation. Stewardship payments and subsidies may need to be used over a longer period in order to ensure the actions continue to be taken. An exception to this may be when the landholder becomes aware of the private benefits of taking the action and so continues to act in the desired manner.

H. Tailoring the chosen incentive

It is important to realise that each incentive should be tailored to the particular situation, taking into account the objective, the characteristics of the targets, the nature of the stakeholders and equity and efficiency concerns. Additional questions to be addressed include:

- Has the incentive been communicated effectively to potential participants? For example, are there information packages accompanying each incentive program? This is an essential part of the design process, and will be critical to its success. Often uptake of incentives is low, perhaps due to problems such as misunderstanding the implications of participation, dislike of dealing with the government, not wanting to be seen as accepting government “handouts”, a complicated application process or a high compliance burden. It is important to recognise and address these concerns.
- Have key stakeholders been involved in the development and implementation of the incentive? Community groups (such as Landcare or catchment care groups) will have the local knowledge needed to develop an incentive package and may be a great way to deliver a program. Some areas may even have developed local plans that can be supported by regional NRM body incentives.
- Does the incentive complement other policy instruments being implemented in the region, such as Australian and State legislation? It is important that regional NRM bodies are aware of programs in their regions so that new incentives do not duplicate those already available. In Queensland, a web-based database has been set up that allows landholders and regional NRM bodies to search for existing incentives offered by the Australian, State and local governments. See <http://www.regionalnrm.qld.gov.au/funding/incentives/>

- The potential legal and financial implications of the incentive should be identified and communicated to participants. For example, will a financial payment be subject to income tax? Will Centrelink payments be affected?
- Regional NRM bodies should be aware that with some incentive mechanisms, transaction costs (such as the time needed to prepare a bid for an competitive tender) might be high for the landholder. These costs should be minimised as much as possible.

Transaction costs for the incentive program should be minimised. Both fixed and on-going (or variable) transaction costs exist for incentives (Whitten et al 2003). Fixed costs include the design of the incentive, any institutional setting changes (such as the enactment of legislation) and the gathering of necessary information. On-going costs include administration and other costs associated with communicating and implementing the program and the monitoring and evaluation of the program's outcomes. A regional NRM body should also be interested in evaluating the process of developing and implementing the incentive mechanism to inform future programs and these costs should also be identified.

Transaction costs will differ between programs, both due to the nature of the incentive mechanism being used and the setting it is being used in. For example, a flat subsidy may require less time for project selection than a competitive tender process that requires many individual site visits. An area that has plenty of information available and the necessary institutional arrangements in place is likely to incur less transaction costs than another area. Remember that the aim is not to have low transaction costs for their own sake but to have maximum value for the money invested. A program that costs more money to run but better targets NRM outcomes and achieves greater change may be better value for money than another program with low costs with poorer NRM outcomes.

An incentive mechanism will perform best if careful thought has gone into its design. However, investment in design should be proportionate to available funding, and should not dominate the time and funds dedicated to the NRM problem. If possible, lessons from other pilots and programs should be used in order to avoid repeating basic design work and making the same mistakes.



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APPENDIX ONE: BRIEF OVERVIEW OF KEY INCENTIVES

This is an outline of the key incentives regional NRM bodies can use in NRM. As stated previously, please see the reference list for more details about these incentives and other incentives available for use by other NRM authorities.

Direct use

Grants

A grant is a sum of money given to a group or individual that assists in undertaking on-ground work. A devolved grant is when one body (such as the Australian government) gives funds to another smaller body to run its own grants scheme. Regional institutions have long distributed funds through a variety of grants programs that fully or partly pay for landholders to undertake desired actions or to change their behaviour. Often regional NRM bodies are themselves recipients of grants, which they then distribute to smaller groups or individuals. Participants may identify the cost of their project when applying, or the grant may be a fixed sum. The benefits of grants are that they are popular and well understood. They are very flexible and can be used in a variety of situations (such as large or small groups addressing problems at a variety of scales). Grants are usually given on the understanding that the recipient contributes resources and/or time to the project as well, which helps involve the community in on-ground work.

The main disadvantage is that it may be difficult for regional NRM bodies to choose the most deserving projects. This may result in less efficient use of funds. If grants are not carefully directed, there is also a danger of “peppercorn” results, where NRM benefits are scattered across the landscape. Grant programs are sometimes administratively complex for applicants, contributing to low take-up of the incentive.

Grants can be a very flexible instrument, and can be applied to most situations. They should be aimed at projects that would not otherwise be undertaken due to a lack of resources. These projects should have clear anticipated outcomes and should be expected to offer high public benefits. It should be possible to estimate the private-public benefit split and provide guidance on the input required from the landholder. Grants may be particularly useful in situations where a “trigger” is needed to help landholders overcome initial barriers to change, such as a new type of equipment or infrastructure. For example, grants could be used to help landholders purchase new low tillage equipment. It is important to remember that there should be clear public benefits from such investment. Finally, grants are a good choice for when community involvement is seen as desirable. Indeed, there are many grant programs aimed specifically at community groups.

The problem of “peppercorn” results may be addressed through giving grants to groups (such as sub-catchment groups) that have a coordinated plan for their area that involves individual landholders and groups. Grants are usually one-off payments and as such may not be suitable for encouraging ongoing natural resource management changes. Another limitation is that grants often address only one action rather than the many changes that might be needed on a property.

Subsidies

Subsidies are payments that effectively reduce the price of goods or services that are seen as environmentally beneficial (eg: fencing of riparian zones) and so encourage their use. A subsidy can meet the full cost of an activity, or can subsidise enough of the cost that it is feasible for the recipient to carry out the activity. Subsidies have also been used extensively in the past. A regional NRM body can choose to subsidise an activity that has significant public benefit. A subsidy can be given to cover part or all of the costs of carrying out an activity. The benefits of a subsidy scheme are that (like grants) they are popular and well understood and can be used in a variety of situations. Small subsidies may be all that is required to enable landholders to carry out NRM activities. The main difficulty with subsidies is determining the correct level. If it is too low, there is likely to be a low response (and thus less NRM change); too high and it will be an inefficient use of funds.

Subsidies are best suited to situations where a price can be set based on the estimated opportunity cost of carrying out the activity, and where these opportunity costs are similar between recipients. The action targeted should be clearly identified as having positive NRM outcomes that benefit the community. Subsidies can be used across large areas. As with grants, subsidies are well suited to triggering change that requires a large initial investment. The Queensland Rural Water Use Efficiency Initiative, which provides subsidies on irrigation equipment and services that decrease water use, is an example of this practice (Coutts and Bell 2003). Otherwise, they may need to be ongoing in order to ensure the actions continue to be taken. Subsidies are best suited to situations where one management activity is being targeted rather than a package.

Stewardship payments

Stewardship payments are payments made to a landholder for carrying out actions that maintain current NRM values or that improve NRM outcomes on their properties. These payments are based on the idea that the landholder would be providing a public service and the level of the fee paid reflects this. The main benefit of a stewardship payment is that they can address more than one problem at a time (eg: address biodiversity and water quality outcomes concurrently) as well as passive management actions (eg: retention of native vegetation). They are a clear way of acknowledging the public benefits from a private landholder's actions. The main difficulty with stewardship payments is deciding on the correct level of payment. Determining eligible activities can also be difficult, as payment should only apply to activities that exceed the landholder's "duty of care", a concept that can be hard to define.

Stewardship payments are best suited to situations where the regional NRM body is attempting to change a range of management actions of private landholders over a longer period of time than a "one-off" project. Stewardship payments suit a situation where there is likely to be only one buyer of an NRM good or service due to its public good nature (such as biodiversity). In this instance it will usually be the government that buys the good on behalf of society. (This is different to established trading markets of other NRM goods, such as water, with many buyers and sellers). As stewardship programs operate on a fixed-price basis, it is preferable that landholders have similar opportunity costs of changing their behaviour, and that regional NRM bodies have some idea of what this opportunity cost is.

Competitive tenders/Auctions

The success of the first two BushTender™ trials has led to a growing appreciation of competitive tenders of conservation contracts for improved NRM (for more information on BushTender™ see Stoneham et. al. 2003). Competitive tenders are also commonly called conservation auctions. This process involves asking landholders to submit bids nominating a management plan for their property and a price for undertaking this plan. Winning bids are chosen on a best ecological value for money basis. This means that price, the ecological significance of the property and the management actions offered (or the change expected) are used to pick the winning bids. Competitive tenders may be based on a variety of desirable NRM outcomes such as improved biodiversity or water quality.

The greatest advantage of an competitive tender is that they may be more cost effective than a flat fee stewardship payment, as the level of funding needed by the landholder is revealed in the tendering process. Like the stewardship payment, competitive tenders allow for a flexible range of management plans. If the process is well explained and landholders supported in the bidding process, a competitive tender should be popular. The commercial nature of a competitive tender mechanism may attract landholders that are not solely interested assisting the environment. However, designing a multi-benefit competitive tender could become complicated, especially if the scientific understanding underpinning the NRM outcomes is uncertain or if the NRM improvement is difficult to determine.

Competitive tenders are suited to similar situations as stewardship payments. Preferably, there should be a number of sellers in order to foster competition and thus cost-effectiveness. However, it should be noted that competitive tenders over a very large area of land are likely to be too complex to manage, and so a balance between competition and practicality must be achieved. If this seems as though it may be a problem, key

sub-regions and properties could be targeted. Competitive tenders may be less suited to problems that require a coordinated response, although it may be possible to favour bids that take neighbour's actions into account. Unlike stewardship payments, competitive tenders suit areas where the opportunity costs of undertaking the management actions differ between landholders. It should also be noted that there have only been a few trials of this approach, and so careful thought would need to be given to the design. Enlisting the assistance of economists and drawing on the expertise of ecologists who can develop a biodiversity benefits index can improve the performance of a competitive tender. Assistance in contract design and in determining a monitoring and evaluation strategy is also worth pursuing.

Negotiated outcome

Another role the regional NRM bodies could play is to coordinate responses to a range of incentives. If cooperative action is required within an area to achieve the objective, the regional NRM body could assist the individuals access a suitable incentive and ensure that enough change occurs across the area. This would help achieve the landscape outcome required. Due to the high costs of negotiating with every landholder, it may be necessary to focus on high priority areas. This model may complement trials of other incentives from the regional NRM body.

Suasive instruments

Suasive measures are aimed at changing an individual or firm's perceptions and priorities about the environment through information provision, education programs and social recognition and pressure schemes. Suasive measures have the benefit of better informing people about the implications of their actions. This information can act as an incentive in two ways. Firstly, private benefits to improved NRM may be highlighted. Secondly, some landholders may wish to change their behaviour if negative public impacts are brought to their attention (this type of information is sometimes called "moral suasion"). Suasive measures are also basic accompaniments to other incentive programs.

Suasive instruments can often be run at a low cost, and thus are a good option for a first choice of instrument. However, suasive measures may not achieve widespread NRM change when used in isolation, and may be best used as a support mechanism for economic and regulatory instruments.

Regional NRM bodies could provide suasive measures to complement their other management actions, as well as the actions of other bodies. When suasive instruments accompany other incentive programs, they can help assist with greater community understanding and acceptance. This should help increase the participation rate in the associated program. Regional NRM bodies are also capable of collecting information needed for programs run by other bodies (for example collecting emission data to assist with the establishment of a trading market).

Information provision about the impacts of an action is likely to be most successful if a negative impact on productivity is highlighted. It is important that information and education campaigns provide practical and clear advice on changing behaviour. Social pressure schemes are more likely to succeed in instances where the scientific evidence for the undesirability of an act is widely accepted. These schemes may not be socially acceptable, as they may not encourage positive cooperation.

Indirect use

Rates rebates

A local government can encourage positive NRM practices through offering an exemption from rates, differential rating or reduction in rates. This change in rating can encourage desirable activities such as the adoption of voluntary conservation covenants or revegetation of sensitive areas on a property. It may be difficult to establish the level of a rates rebate (if it is too low, the activity will not be encouraged; if it is too high the revenue loss may be higher than the outcome justifies). Rates rebates are probably best suited to areas where rates are high enough that a rebate would act as an incentive for change. However, offering a rebate can still be effective in areas where rates are low as this provides a good signal to landowners that

conservation is an important land use. This is especially true if agricultural production attracts a rebate, as otherwise moving from agriculture to conservation will lead to an increase in rates.

Some local governments in remote areas with low rate bases may find it financially difficult to offer rate rebates. In this instance, regional NRM bodies might be able to financially support local governments offering rate rebates for certain activities that help achieve priority outcomes. If the rate rebate program were to continue indefinitely, it might be more difficult for a regional NRM body without permanent funding to provide financial support. These bodies may be able to set a trust fund to guarantee funding for a longer period of time. In other circumstances, regional NRM bodies could let local governments know which management actions are a regional priority, and encourage them to support these actions with rates rebates.

Tax concessions

Tax rebates, exemptions or deductions are additional tools that aim to encourage improved NRM through financial incentives. For example, there is a Australian income tax deduction for donations of land to conservation groups (subject to various conditions). The main benefit of tax concessions are that they can be delivered through the current tax system, thus saving on administration costs. Tax concessions are likely to be a popular tool. The main disadvantage to tax concessions is that they are not as useful to producers with low incomes and thus low tax contributions, and so the strength of the incentive can be reduced. The best use of a tax incentive will be to encourage a specific management action on properties that are likely to be in a financial position to take advantage of it. It is not possible to directly target key properties with a tax concession.

This tool is only open to direct use by State and Australian Governments, and consequently the primary role regional NRM bodies can play will be in promoting the use of current tax incentives to landholders and their financial advisers. Regional NRM bodies could also identify problems with current tax incentives (including whether they encourage poor NRM) and possible new tax incentives and communicate these recommendations to the government responsible. Landholders who are participating in an incentive program should be notified as to the potential tax implications of receiving incentives as this can change their opportunity costs of participation.

Voluntary conservation covenants and agreements

Conservation covenants are legally binding agreements between a statutory authority and a landholder. Each state has different arrangements, but typically, the only authorities able to offer conservation covenants are State agencies and departments, and some local governments and not-for-profit organisations. Covenants can be common law agreements that last for a specified length of time or statutory agreements that are attached to the title of the land and bind future landholders.

The covenant will specify certain conservation activities to be undertaken by the landholder, such as leaving remnant vegetation standing and/or actively managing the natural resources on the property through such actions as fencing and revegetation.

The main benefit to conservation covenants is that they are voluntary and can protect important NRM resources on private lands. Additionally, a range of NRM issues can be addressed in the one agreement. This instrument will attract landholders who are concerned about the future management of their properties. The main disadvantage, however, is that the voluntary nature of the agreements may mean that key properties are not protected and a coordinated landscape outcome may not occur.

A similar mechanism is a management agreement. These operate in a similar manner to conservation covenants except that they are not attached to the land title in perpetuity. Rather, they are a binding agreement with the current landholder. Although these agreements do not offer permanent protection, they may attract landholders that are worried about the effect of a covenant on their land value.

Regional NRM bodies could publicise the various conservation covenant and agreement programs available in their region. Rate rebates and tax concessions are often used to encourage the adoption of conservation covenants, and so regional NRM bodies could also assist in providing these supporting incentives (as per previous discussion).

APPENDIX TWO: SUMMARY TABLE OF INCENTIVES INCENTIVES FOR DIRECT USE

Instrument	Description	Benefits	Possible problems	Best suited to:	Where has it been applied?
Grants	On-ground activities are supported through funding – can be devolved from higher authority or be direct to landholder	-well understood and popular -can be used for a variety of actions and at many scales -helps involve communities -can set up so as to direct funds to target areas -can be given to groups	-difficult to choose the most deserving project -project choice may be ad hoc and poorly coordinated	-most NRM problems -usually a once-off situation – may not suit ongoing problems -when a one-off “trigger” is needed to change practices -when community involvement desired -where public benefits or opportunity costs can be estimated	Many situations including the recent Australian Government Envirofund
Subsidies	Cost of an environmentally beneficial activity is subsidised in order to encourage uptake	-well understood and popular -can be used for a variety of actions and at many scales	-difficult to determine correct level of subsidy -must be highlighted if the subsidy is for a limited time -may have perverse outcomes	-situations where opportunity costs of farmers to change are similar and can be estimated and used as a subsidy level -when a one-off “trigger” is needed to change practices -where one action is targeted	A popular use of NHT funds, eg: subsidies on fencing materials for riparian zones
Stewardship payments	Landholder is paid to provide NRM services that provide a public benefit	-can incorporate more than one activity in a payment -wide variety of management actions can be included in one payment -can encourage and reward ongoing positive management	-difficult to choose payment level -may be difficult to identify suitable actions (to provide public benefit NRM services)	-situations where opportunity costs of farmers to change similar and can be estimated and used as a payment -applicable to actions with clear outcomes -areas with few participants -areas where negotiation and control of actions needed	Many examples of flat-fee stewardship payments in Europe and the United States. Have been distributed via tender in Australia (see below)

<p>Competitive tenders of conservation contracts</p>	<p>Landholders submit a bid to undertake planned management actions on their property. Winning bids chosen on basis of most cost effective provision of conservation services. An efficient method of delivering stewardship payments</p>	<ul style="list-style-type: none"> -no need to choose appropriate payment or estimate public benefit as each landholder nominates the amount needed -very flexible, and can be adapted to different areas -may be very cost effective -may attract new participants 	<ul style="list-style-type: none"> -may be administratively more complex (especially as a relatively new mechanism) -may be difficult to construct a biodiversity benefits index that is flexible enough to reflect complex ecological reality 	<ul style="list-style-type: none"> -opportunity costs of change should be different -there should be enough landholders to encourage competition -smaller geographical areas may be easier to manage -need to be careful if coordinated response wanted 	<p>Two BushTender™ trials in Victoria (Stoneham 2003), another trial with the Liverpool Plains Land Management Committee and WWF in NSW. Other pilots now occurring around Australia</p>
<p>Suasive</p>	<p>Education, training and social recognition schemes aimed at changing an individual's NRM perceptions and priorities</p>	<ul style="list-style-type: none"> -may be less costly than other instruments -complement other instruments 	<ul style="list-style-type: none"> -some areas have already been saturated with material -unlikely to bring about landscape change alone -uncertain outcomes 	<ul style="list-style-type: none"> -to help prepare for the use of other incentives and to assist with the uptake of other incentives -highlighting private benefits 	<p>Many examples such as FarmBis and Land for Wildlife.</p>
<p>Negotiated outcome</p>	<p>Coordinate landscape response to range of incentives</p>	<ul style="list-style-type: none"> -each landholder is "matched" to the incentives suiting their needs -involves face to face contact 	<ul style="list-style-type: none"> -too costly to carry out on a widespread basis -appropriate incentives may not exist 	<ul style="list-style-type: none"> -in a key area with less people -where high degree of control over management actions needed 	<p>-Indigenous Land Use Agreements</p>

INCENTIVES FOR INDIRECT USE

Instrument	Description	Provided by...	Method of support by regional NRM body	Benefits	Problems
Rate rebate	A discount on rates given to landholders who undertake positive NRM actions (eg: revegetation, taking up a covenant)	Local governments	Support local governments with financial aid and planning support	<ul style="list-style-type: none"> -can assist with establishing positive incentives for change in areas with a low rate base -can support other programs such as conservation agreements 	<ul style="list-style-type: none"> -may be difficult to undertake on a long term basis if the regional NRM body does not have long term funding -rates may be too low to act as an incentive
Tax concessions	A tax rebate, exemption or deduction is offered for improved NRM	Australian and state governments	Publicise these incentives to landholders	<ul style="list-style-type: none"> -established and long-running tax concession programs already exist -can support other programs 	<ul style="list-style-type: none"> -not as useful for low income farmers
Voluntary conservation agreements and covenants	Conservation covenants are legally binding agreements between a statutory authority and a landholder	Different in each state, usually offered by State agencies, some local governments and not-for-profit organisations	<ul style="list-style-type: none"> -publicise current programs (along with any accompanying incentives). -support creation of new programs 	<ul style="list-style-type: none"> -the management agreement address a range of problems with varying levels of action -acts as an incentive for landholders concerned about future uses of land -different levels of agreements can attract different landholders 	<ul style="list-style-type: none"> -coordinated landscape outcome highly unlikely

