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Choosing between incentive mechanisms for natural resource management: a practical guide for regional NRM groups in Queensland

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The National Action Plan for Salinity and Water Quality (NAPSWQ) is a joint Australian and Queensland Government initiative that encourages governments and regional communities to work together to address salinity and water quality issues in priority catchments throughout Queensland. This document has been produced under the NAPSWQ using Australian and Queensland Government financial support.

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Readers should be aware that some information might be superseded with further scientific studies and evolving technology and industry practices.

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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. There will not be a definitive answer for any situation. This paper contains the following sections:

- 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.
- A list of incentive mechanisms that regional NRM bodies can directly and indirectly use to influence environmental outcomes.
- Background questions a regional NRM body should answer before attempting to choose an incentive mechanism. These questions 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.
- A series of questions that are designed to help regional NRM bodies choose the appropriate mechanism for the situation they are looking at.
- Other considerations surrounding the tailoring of the chosen incentive are outlined.
- A reference list (with internet links where possible) of key references.
- Contact list for the Social and Economic Unit staff (funded under NAPSWQ and sitting within NRM&E) who can assist regional NRM bodies in the design, application and monitoring of incentive mechanisms.
- An appendix with 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 that 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 design and use of incentives is a rapidly emerging field. This paper represents a reasonable summary at the time of writing. Information in this paper may be updated as new information on incentive mechanisms becomes available through programs such as the National Market Based Instruments Pilot Program, the use of incentives by government agencies and through the use of incentives by regional NRM bodies. Regional NRM bodies will be notified when any material amendments or additions are made to the document.

Choosing between management 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 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 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 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 the owner does not want to manage it for conservation. 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 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.

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 being prescribed.
- 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 environmental work once a precedent is set.
- Because incentives are voluntary, uptake may be lower than under regulation and so the biophysical outcomes may be slight. Alternatively, key people/companies may choose not to participate. 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.


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.

What incentive mechanisms are available?

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 Agrans Research 2003). A brief summary of the various incentives is attached in the appendices. For additional information to that in the appendices, please use the internet links in the reference list, or contact a member of the Social and Economic Unit for a copy of the desired paper.

Which incentives can regional NRM bodies directly implement?

Queensland regional NRM bodies are limited in the selection of incentives they can directly apply. The non-statutory nature of Queensland regional NRM bodies means that they are legally unable to use many of the incentive mechanisms available. For example, regional NRM bodies are unable to raise levies or institute taxes in their regions. Similarly, a permanent cap and trade market for emissions could not be independently established due to the lack of enforcement powers and permanent funding. However, regional NRM bodies can use the following incentives to directly influence NRM:

- Grants
 - Subsidies
 - Stewardship payments (over a set period of time)
 - Auctions for conservation contracts for a variety of environmental outcomes
 - Negotiated outcome
 - Education and training
 - Information provision
 - Social recognition/pressure schemes
- Suasive instruments
- 

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

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. 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. These incentives include:

- Environmental taxes (such as effluent charges)
- Environmental levies
- Differential product development
- Changes to leasehold agreements
- Environmental 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.

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 environmental problem and possible solutions. These solutions will be management actions that maintain environmental values or improve the environmental outcome, such as protection of vegetation or protection of riparian zones through fencing. Information about the community involved 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.

What's the NRM problem being addressed?

The regional body NRM plans will have identified priority NRM problems in their region, in most cases manifested as a biophysical problem, such as overgrazing in a riparian zone 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?

What's the objective/s?

The regional body NRM plans will have outlined and prioritised environmental 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 environmental. 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 an auction 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.

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 environmental objectives. For example, changes in land management (such as a change in crop irrigation patterns) may help alleviate potential salinity problems. Incentives can then be targeted at these changed management actions. Once again, the regional NRM body Management 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 auctions 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. 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 may result from a poorly planned management action. For example, subsidising a weed control chemical may result in over application that could in turn lead to poor water quality.

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. (For more information on these barriers see the paper by the Social and Economic Unit called *Drivers of poor NRM* [still in development]). Similarly, the 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 more correctly 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 (see the practical guides developed by the Social and Economic unit *Compiling Regional Social and Economic Profiles and Conducting Social and Economic Impact Assessment* [These are available at http://www.regionalnrm.qld.gov.au/planning/state_wide/nap/se01.html] and Cavaye’s (2003) *Integrating economic and social issues in regional natural resource management planning*).

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. 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 potentially financially harmful 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. Alternatively, a second party, such as non-government organisation, may be able to help with the delivery.

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 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.

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. There will be some support for the design of incentives from the Social and Economic Unit staff (see contact detail list).

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 community groups in the planning process.

Questions informing the choice of incentive instruments

These questions 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 environmental benefit at the lowest economic cost, such as auctions and cap-and-trade markets, are 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 an auction can be designed to allow for cooperation between neighbouring properties (if necessary to achieve the outcome such as biodiversity). 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 more 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, auctions and negotiated outcomes are practical in a problem being targeted at a smaller scale. (In the case of an auction, there should be enough people to make an auction 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. Auctions 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 auctions and tradeable permits do not allow for this type of control. In this situation, directed grants, subsidies and negotiated outcomes may be the best instruments.

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

The amount of scientific knowledge surrounding the environmental problem should be established before choosing an incentive. As well as informing the planning and priority setting process, this assists with identifying behaviour changes 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, environmental offsets have a high risk of failing to deliver reliable environmental outcomes if there is not sound scientific knowledge underpinning the process. If the full suite of cumulative environmental impacts cannot be predicted, an unintended environmental loss may result. Multiple benefit auctions 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 uncertain. If there is great uncertainty about the relationship between actions and environmental 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 are good in this type of situation, as they improve understanding with less risk involved.

Is there a set funding timeframe?

Most regional NRM bodies are not presently guaranteed a set source of funding for longer than the next few years. This creates an operational constraint to using some types of incentive programs. For example, assisting with the establishment and running of a permanent trading market would not be practical for the majority of 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 means that sub-optimal options may have to be chosen. For example, an ongoing auction 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 auctions, 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.

It should be noted that some regional NRM bodies are aware of this problem and are seeking a more secure source of funding (for example from industry groups) to ensure certainty in regional NRM planning and investment in improved NRM outcomes.

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

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 incentive mechanisms 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 auctions are able to target actions on private lands that contribute to diffuse problems, such as maintaining riparian vegetation.

Are the properties similar to each other?

In some areas, properties are similar to each other with regards to size, environmental 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 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, an auction 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.

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 auctions and stewardship schemes, it may be to provide detailed information about the mechanism.

Tailoring the chosen incentive

There are additional considerations in choosing the appropriate instrument. 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. Uptake of incentives in Queensland has often been low, perhaps

due to problems such as misunderstanding the implications of participation, dislike of dealing with the government and not wanting to be seen as accepting government “handouts”. 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? Information on current incentives being offered by the Australian, State and local governments for Queensland landholders is now available on a searchable incentives database at <http://www.regionalnrm.qld.gov.au/funding/incentives/> It is important that regional NRM bodies are aware of programs in their regions so that new incentives do not duplicate those already available.
- 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 lots of time needed to prepare a bid for an auction) may be high for the landholder. These costs should be minimised as much as possible.

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. Staff members funded under the NAPSWQ are available to help with the design of incentives (contact details follow), and a range of guidance products are being developed to assist with specific incentive design issues. There is also funding available to design, implement, monitor and evaluate innovative incentive mechanisms. Please contact Dr Beth Clouston for more information about the application process for these funds.

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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 a specified action. 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 environmental benefits are scattered across the landscape. Grant programs are sometimes administratively complex for applicants, contributing to low take-up of the incentive.

Grants are 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, the Rural Water Use Efficiency Initiative is aimed at achieving this type of change (Coutts and Bell 2003). 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. A project under the social and

economic SIP will be the development of generic guidelines for an effective grant process for regional NRM bodies, including guidance on public-private benefit splits.

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 environmental 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 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 is being targeted rather than a package.

Stewardship payments

Stewardship payments are payments made to a landholder for carrying out actions that maintain current environmental values or that improve environmental 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. Stewardship payments suit a situation where there is likely to be only one buyer of an environmental 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 environmental 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.

Auctions/Tenders

The success of the first two BushTender trials has led to a growing appreciation of auctions of conservation contracts for improved NRM (for more information on BushTender see Stoneham et. al. 2003). Auctions are also commonly called tender mechanisms. 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. Auctions may be based on a variety of desirable environmental outcomes such as improved biodiversity or water quality.

The greatest advantage of an auction 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, auctions allow for a flexible range of management plans. If the process is well explained and landholders supported in the bidding process, an auction should be popular. The commercial nature of an auction mechanism may attract landholders that are not solely interested assisting the environment. However, designing a multi-benefit auction could become complicated, especially if the scientific understanding underpinning the environmental outcomes is uncertain or if the environmental improvement is difficult to determine.

Auctions 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 auctions 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. Auctions 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, auctions 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. Social and economic SIP funds are being used to develop a generic auction framework for regional NRM bodies called *Guidelines for the conduct and evaluation of tenders for conservation contracts*.

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. A future paper from the Social and Economic Unit will help explain this notion of a “brokerage for incentives” model, and funds may be available to assist with pilots centred on negotiating a landscape outcome.

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. This will be especially helpful in Queensland, where historically incentive uptake has been low, perhaps due to negative perceptions of the program or incorrect assumptions about their impacts. 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 environmental 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 loss in rates rebates 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, even in other areas offering a rate rebate is 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 councils 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 councils offering rate rebates for certain activities that help achieve priority outcomes. If the rate rebate program were to continue indefinitely, it would be more difficult for a regional NRM body to provide financial support, as they might not have guaranteed long term funding. Some bodies may be able to set a trust fund to guarantee funding for a longer period of time, though the expected environmental outcomes would have to be high to justify this action. In other circumstances, regional NRM bodies could let local councils 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 at encouraging improved NRM with financial incentives. For example, there is a Australian income tax deduction for donations of land to conservation groups (subject to various conditions) and a State land tax rebate for landholders that place a conservation covenant upon their land within a year of purchasing the property. 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 accountants (information on these and other incentives currently offered by all levels of government will be available soon on a database set up by the Social and Economic Unit). 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.

Voluntary conservation covenants and agreements

Conservation covenants are legally binding agreements between a statutory authority and a landholder. In Queensland, the only authorities able to offer conservation contracts are State agencies and departments and local governments. The agreement 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. 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 main benefit to conservation covenants is that they are voluntary and can protect important environmental 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 voluntary conservation 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 will attract landholders that are worried about the effect of a covenant on their land value.

Regional NRM bodies could publicize the various conservation covenant and agreement programs available in their region. If local councils in the region have not created these programs, regional NRM bodies could encourage and support the development of conservation covenant and agreement programs. 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	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 NHT 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 Also the Rural Water Use Efficiency Initiative (see Coutts and Bell)

Stewardship payments	Landholder is paid to provide environmental 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 -flexible	-difficult to choose payment level -may be difficult to identify suitable actions (to provide public benefit environmental 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	A program is being developed in South Australia under the Upper South East Dryland Salinity and Flood management program (USE) to give biodiversity stewardship payments
Auctions of conservation contracts	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. A method of delivering stewardship payments	-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 be administratively more complex (especially as a relatively new mechanism) -may be difficult to construct an index that is flexible enough to reflect complex ecological reality (however this applies to all incentives)	-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	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

Suasive	Education, training and social recognition schemes aimed at changing an individual's environmental perceptions and priorities	-may be less costly than other instruments -complement other instruments	-some areas have already been saturated with material -unlikely to bring about landscape change alone -uncertain outcomes	-to help prepare for the use of other incentives and to assist with the uptake of other incentives -highlighting private benefits	Many examples such as FarmBis and Land for Wildlife.
Negotiated outcome	Coordinate landscape response to range of incentives	-each landholder is "matched" to the incentives suiting their needs -involves face to face contact	-too costly to carry out on a widespread basis -appropriate incentives may not exist	-in a key area with less people -where high degree of control over management actions needed	-Indigenous Land Use Agreements

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 environmental actions (eg: revegetation, taking up a covenant)	Local governments	Support local governments with financial aid and planning support	-can assist with establishing positive incentives for change in areas with a low rate base -can support other programs	-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

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Tax concessions	A tax rebate, exemption or deduction is offered for improved NRM	Australian and state governments	Publicise these incentives to landholders	-established and long-running tax concession programs already exist -probably be popular -can support other programs	-not as useful for low income farmers
Voluntary conservation covenants	Conservation covenants are legally binding agreements between a statutory authority and a landholder	NRM&E, EPA and local governments	Publicise current programs (along with any accompanying incentives). Support creation of new programs	-voluntary -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	-coordinated landscape outcome highly unlikely