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The Hon. Pam Allan MP
Chairperson
Legislative Assembly Standing Committee on Natural Resource Management
Parliament House
Sydney, NSW 2000

Dear Ms Allan

In response to your letter of 17 July, I am pleased to enclosed ABARE's submission to the Standing Committee on Natural Resource Management into the Sustainable Management of Natural Resources in NSW. The ABARE papers cited in the submission and the submission itself will be emailed to you.

If you require additional information on any aspect of the submission, please contact Ms Anna Heaney on (02) 6272 2066.

Yours sincerely,

BRIAN FISHER
Executive Director

6 August 2003

Enc: ABARE submission to the Standing Committee on Natural Resource Management - Facilitating Efficient Water Trade

Efficient water trade and salinity

Introduction

In the Murray River, the major source of salinity is discharge from irrigation areas that have highly saline ground water (MDBMC 1999). Research undertaken at ABARE has showed that water trade has the potential to further exacerbate instream salinity problems for this region. The productivity of irrigators not directly engaged in the trade could be adversely affected if the trade reduced the quantity or quality of water they received.

The effects of trade

Trade in water entitlements was identified as a key mechanism for maximising the contribution of water to national income during the 1994 Council of Australian Governments (COAG) forum. A well designed water market can be an effective mechanism for facilitating the transfer of water to higher value uses, thereby increasing the allocative efficiency of water use (Goesch 2001).

Water trade could also be instrumental in minimising the cost of sourcing additional flows. Any increase in stream flows for environmental or social objectives would have to be sourced from existing or potential consumptive uses such as irrigation. Hence, the social costs of providing water will be influenced by the value of activities from which water is withdrawn. Trade will reduce the costs of sourcing additional flows if it facilitates the withdrawal since water would ultimately be sourced from the lowest value uses (Heaney, Beare and Goesch 2002).

However, water trade can change the pattern and quality of flows returning to water courses. Regions and farms are often spatially different in terms of their ground water salinity, soil types and irrigation practices, factors that can influence the impact of irrigation on water quality. As trade allows water to move between regions and farms, the net effects on instream salinity can be quite different for each trade.

Consider a trade that moves water from an irrigation area with relatively low recharge rates and low ground water salinity to a downstream irrigation area with high recharge rates and high ground water salinity. Immediately downstream of the seller, the transfer may increase stream flows and reduce river salt concentration. However, as recharge rates are high in the downstream area, surface runoff will be lower, reducing the volume of return flows available downstream of the buyer. Further, as ground water salinity is higher downstream, salt concentration will be increased as more salt is transported to the river system (Beare and Heaney 2002).

Similarly, trade out of regions that typically act as net importers of salt, such as the Murrumbidgee, would result in an increased quantity of salt being exported downstream. However, if the water were traded to a region with higher instream salt concentrations, such as the Murray, then the trade would act as a dilution flow and improve water quality despite the higher salt load.

Framework for policy reform

The objective of water policy reform should be to maximise the benefits provided by our water resources. An effective way to do this would be to develop water markets that facilitate efficient trade. The market should be free of any unnecessary institutional restrictions on trade but still take into account the full costs and benefits of trading water. In some situations, however, the substantial transaction costs incurred in setting up such a market may make it more efficient for the market to have some elements of imperfection.

Efficient trade

For markets to promote efficient trade between alternative water uses, water access rights must clearly define the rights and responsibilities of individual water users. Ideally these access rights would allow individual irrigators full access to the benefits of water use and hold them accountable for all the costs imposed on other users and the environment. This would allow the full benefits and costs of transferring water between alternative users to be accounted for through trade. However, as with most common resources, the definition, monitoring and enforcement costs of establishing individual access rights can generate significant transactions costs.

In some cases, the costs involved with establishing a perfectly defined water access right conducive to efficient trade would be greater than the potential benefits derived from trade. In these situations imperfect access rights that may lead to some forms of market failure may still generate a more efficient allocation of water resources than an administered allocation system.

Accounting for the external impacts of trade

A variety of market based mechanisms could potentially be used to account for the impacts of interregional trade. These instruments can be divided into quantity based mechanisms, such as quotas, or price based mechanisms, such as taxes, subsidies or a system of exchange rates (Heaney and Beare 2001).

The effectiveness of alternative instruments will vary depending on the physical and economic nature of the problem. The case for any particular instrument will depend on whether it is efficient, and whether the benefits of market intervention exceed the transaction and other costs of the instrument's implementation. Some key points to consider when comparing the efficiency of different instruments are listed in table 1.

Any institutional arrangements should attempt to encourage water trade out of 'high salinity impact' areas into 'low salinity impact' areas. However, many irrigation regions actively constrain, or do not permit, out of scheme permanent trade for a number of reasons including the risk of stranded assets. However, there may be more effective mechanisms for dealing with these problems besides placing restrictions on trade. The stranded assets problem, for example, may be better dealt with by using a multipart pricing regime or long term contracts that still allow trade (Goesch 2001). Addressing these institutional barriers to trade should be a priority for policy makers since they act to reduce the potential benefits that would otherwise be achieved from trade.

Table 1 Instruments for accounting for externalities in water trade a

Water availability	Water demand	Externality	Instrument comparison
Variable	Constant	Fixed	Fixed tax/subsidy or fixed quantity restriction both efficient b
Variable	Variable	Fixed	Fixed tax efficient but fixed quantity restriction inefficient if demand increases. Could set a variable quantity restriction but would considerably increase transaction costs of scheme c
Variable	Variable	Variable	To be efficient, taxes/subsidies would need to be location specific. The complexity and cost of transactions may make this scheme impractical d

a Table derived from information in Beare and Heaney, 2002.
b Owners of water entitlements may tend to favor quantity restrictions over a tax, as a tax will impose greater reductions on the value of entitlements.
c Owners of water entitlements may still favor quantity restrictions over a tax if the tax imposes greater reductions in the value of entitlements. This will be more likely if the owners of the entitlement sell or lease their entitlement rather than use it themselves.
d A second best solution may be to set regionally specific taxes and subsidies rather than location specific ones. Trading arrangements could be supplemented by administrative restrictions such as trading ratios or exchange rates between irrigation regions.

Conclusion

The benefits of water trade can be undermined if the institutional arrangements that govern water trade do not account for the external costs and benefits of water use in different locations. While trade allows water to move to its highest value use, it could potentially exacerbate instream salinity and also undermine efforts to source environmental flows from high salt impact areas.

Given the complications and large transaction costs associated with implementing site specific schemes and instruments, a regionally based scheme may be an effective second best solution. An example may be allowing trade in salinity mitigation credits or water use rights between irrigation areas as opposed to individual irrigators. These trading arrangements could be supplemented by administered restrictions such as trading ratios or exchange rates between irrigation regions. However, the potential benefits from any specific intervention will depend on the physical and economic characteristics of the problem.

References

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